FARMING FOR THE FUTURE

Heritage Fund

PROGRESS REPORT 1983

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I am pleased to present to Albertans the fourth annual Progress Report of the Farming for the Future agricultural research program. This report covers the program's fourth operational year which ended March 31, 1983.

Farming for the Future is supported by the Alberta Heritage Savings Trust Fund and is designed to improve both net farm income and the long-term viability of Alberta's agricultural industry. In 1982-83, Farming for the Future's original funding program, the Research Program, made substantial progress in fulfilling the research needs of the province's agricultural sector. During the year, 40 new projects were started at a cost of $1.6 million and 101 projects received $4.1 million in renewal funding. The total allocation for this program during the year was $5.7 million.

Farming for the Future is administered by the Agricultural Research Council of Alberta. As its new Chairman, I am fortunate to have the advice and counsel of distinguished Albertans who have made their mark as producers, scientists, legislators and public sector managers. The range of knowledge, talent and experience they collectively bring to the Council is vital to the continued success of Farming for the Future.

Last February, the Council met to approve 1983-84 funding for the Research Program. Ninety-three projects received renewal funding and 49 new projects were approved. Total funding allocated to the Research Program for the 1983-84 fiscal year is $7.0 million.

Two new programs — the Graduate Student Research Support Program and the On-Farm Demonstration Program — were instituted in 1982 to complement the Research Program. The On-Farm Demonstration Program has been successful in transferring newly developed technology onto the farm. Between January 1982 and March 1983, a total of 48 On-Farm projects were approved at a cost of $166,000. During the same period, $117,350 were awarded to 17 projects under the Graduate Student Research Support Program.

As a major Heritage Fund project, Farming for the Future represents a significant investment in maintaining agriculture as a cornerstone of Alberta's economy and society. As a public investment vehicle, Farming for the Future is beginning to show signs of being very cost effective. In a successful business, the return on outputs should be greater than the cost of inputs. The return on investment in agricultural research is conservatively estimated to be seven times the cost. With many Farming for the Future projects producing substantial results in terms of new knowledge and technology of direct benefit to our industry, I believe Farming for the Future could meet or even exceed this cost:return ratio.

That expectation comes, in part, from my previous service on the Agricultural Research Council as the representative of Alberta's Legislative Assembly. I know Farming for the Future has been rigorously administered, and my colleagues on the Council deserve credit for its success to date.

There have been a number of changes in the Council's membership during the last year, and I wish to express special thanks to all members who have completed their term of office.

In particular, I would like to acknowledge the strong leadership provided by my predecessor, Mr. Dallas Schmidt, the former Alberta Minister of Agriculture. Dallas retired at the time of the provincial election in November 1982. After many years of public service, we owe him a debt of gratitude for his numerous contributions to the development of agriculture in Alberta.

Mr. Gordon Hachey, a producer member from Falher, Alberta, resigned to become Assistant Administrator of the McLennan Hospital. His services as an active member of the Council are much appreciated.

Dr. John Bowland resigned from the Council on July 1, 1983 when he completed his term as Dean of the Faculty of Agriculture and Forestry, University of Alberta. I wish to recognize Dr. Bowland's contributions to our agricultural industry as a researcher, as Dean of the Faculty of Agriculture and Forestry and as a member of the Agricultural Research Council of Alberta.

Dr. C.R. (Bob) Elliott represented Agriculture Canada on the Council for four years. Dr. Elliott has compiled an enviable record of service to agriculture, particularly as a forage researcher. He resigned from the Council upon his election last November as MLA for the Constituency of Grande Prairie.

There have, of course, been a number of appointments to fill these vacancies. It gives me much pleasure to congratulate the following new members on their appointments and to extend to them a warm welcome to the Council:

Dr. Roy Berg, Dean
Faculty of Agriculture
and Forestry
University of Alberta
Edmonton

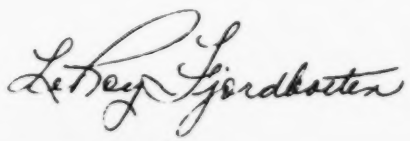
Mr. Nigel Pengelly, MLA
Innisfail

Mr. Neal Harris, Producer
Beaverlodge

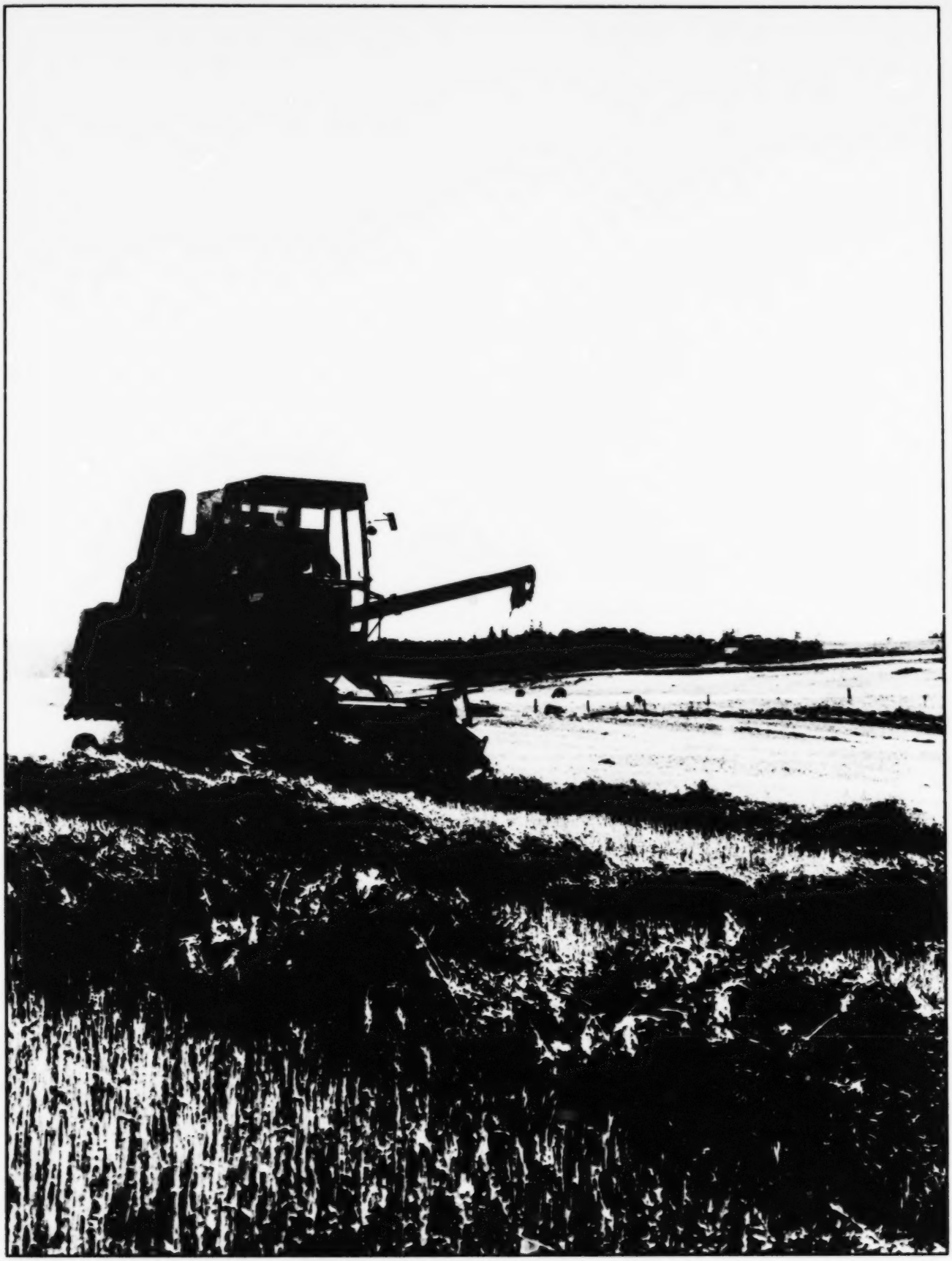
Dr. Don Waldern, Director
Agriculture Canada
Research Station
Lacombe

These new members bring added dimensions to the Council by virtue of their broad knowledge, talent and experience. My colleagues and I look forward to working with them.

A final word on the outlook for Farming for the Future. The program's mandate ends in March 1984. During the last two years, the Council critically examined the program and recommended that it continue in its present form. Based on the success of the program and the vital need for agricultural research, I am very hopeful that Farming for the Future's mandate will be renewed.



LeRoy Fjordbotten
Minister of Agriculture
Chairman, Agricultural Research Council of Alberta
September 1983



Alberta's agricultural industry is a multi-billion dollar business. To improve its competitive position both nationally and internationally, Alberta producers require the ongoing introduction of improved agricultural technology. This requires a heavy investment of funds in research and development.

Recognizing the need to intensify Alberta's agricultural research effort, the Minister of Agriculture announced the creation of Farming for the Future in October 1977. Farming for the Future, which is financially supported by the Alberta Heritage Savings Trust Fund, has two specific objectives: to improve the long-term viability of agriculture in Alberta and to help improve the net income of Alberta producers.

Farming for the Future's mandate is to support the advancement of agricultural technology by augmenting and complementing research endeavours carried out by universities, private industry and agencies of the provincial and federal governments. Its major emphasis has been and continues to be aimed at research scientists. This effort is now called the Research Program.

In 1982-83, the newly formed Irrigation Program Committee approved the first irrigation projects to be supported under the Research Program. These projects were funded jointly by Farming for the Future and the Alberta Irrigation Council.

In 1982-83, two new funding programs were instituted under Farming for the Future. In order to assist the dissemination of agricultural technology to producers, the On-Farm Demonstration Program was created. As well, the Graduate Student Research Support Program was initiated to provide financial support for graduate student research projects that relate to Alberta's agricultural industry.

ARCA ACTIVITIES

Farming for the Future is administered by the Agricultural Research Council of Alberta (ARCA). Created in April 1978, the Council is designed to reflect the broad interests of Alberta's agricultural industry. It is presently composed of 15 members: the Minister of Agriculture (Chairman), the Deputy Minister of Agriculture (Vice-Chairman), seven producers, and one representative each from Alberta Agriculture, the University of Alberta, the Alberta Research Council, Agriculture Canada, the Legislative Assembly of Alberta and the Alberta Irrigation Council.

Among the Council's chief responsibilities are identification of the research needs and priorities of Alberta's agricultural industry and helping to ensure continuity and expansion of agricultural research in Alberta. To meet these aims, the Council adopted a number of new policies and operational procedures in 1982-83.

Key to these changes are the revised Terms of Reference for Farming for the Future which the ARCA approved in February 1983. In turn, they are the basis for a number of other administrative and policy changes.

Among the changes in the revised Terms of Reference are:

- inclusion of the On-Farm Demonstration Program and the Graduate Student Research Support Program,
- expanded criteria upon which project proposals are judged,
- updated requirements for progress and final reports and clarification of Council's right to audit projects and make on-site inspections,
- revised terms of office for certain Council members.

Under the revised Terms of Reference, Alberta Agriculture's Research Division provides all administrative services for Farming for the Future. This division, created in November 1982, co-ordinates and manages departmental research programs and administers the Alberta Agricultural Research Trust as well as Farming for the Future.

Early in 1982, the Council decided there was a need to increase public awareness of Farming for the Future and agricultural research issues as well as to upgrade public distribution of research results.

Farming for the Future publications provided one means for increasing the program's visibility in 1982-83. Publications concerning Farming for the Future project approvals and selected project results were distributed as inserts in the *Country Guide* magazine and through direct mailing. Farming for the Future also published a pamphlet series as well as the *1982-83 Progress Report*.

A travelling display was constructed for Farming for the Future and was set up at 15 farm fairs, exhibitions and conferences between June 1982 and March 1983. Also, signs identifying projects under the Research and On-Farm Demonstration Programs were erected at research sites across the province. These promotional devices have played a distinct role in increasing public awareness of Farming for the Future in Alberta.

In July 1982, the Council toured the University of Alberta's agricultural research facilities in Edmonton, Ellerslie and Kinsella. This tour afforded Council members an opportunity to observe research efforts at first hand and to discuss interests and concerns with research scientists.

The Agricultural Research Council of Alberta has established nine program committees to review and evaluate research proposals submitted for support under Farming for the Future's Research Program. Each program committee is responsible for a specific component of Alberta's agricultural industry, although the nature of many proposals is such that a number of committees may review them. The committee names are: Apiculture/Entomology; Cereals and Oilseeds; Forages; Irrigation; Land Use and Engineering; Non-Ruminants; Processing, Transportation, Marketing and Socio-Economics; Ruminants; and Special Crops. Each committee is chaired by a member of the Council and is composed of producers, scientists and public sector managers.

Under the Research Program, project proposals are submitted each fall and are directed to the appropriate program committee(s) for evaluation. Each proposal is appraised in terms of Farming for the Future's objectives, the merit of the proposed research and the current information needs of Alberta's agricultural sector. Committee evaluations and recommendations are then forwarded to the Council for a final decision.

For the 1982-83 fiscal year, the Agricultural Research Council of Alberta approved 141 projects under the Research Program. Of these, 101 projects received renewed funding of $4.1 million and 40 new projects were approved for $1.6 million.

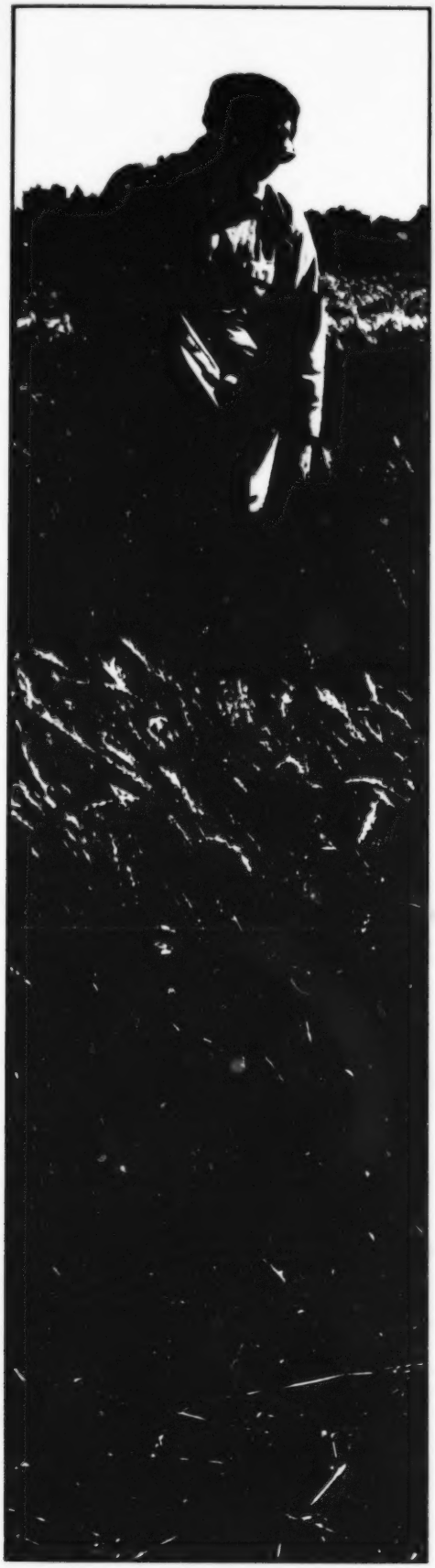
For 1983-84, the Council's funding decisions were made at a two-day meeting held in February 1983. Forty-nine new research projects were approved at a cost of $2.5 million. Another 93 projects received renewal funding. Therefore, in 1983-84, Farming for the Future is expected to support 137 projects under its Research Program at a total cost of slightly more than $7.0 million.

RESEARCH PROGRAM HIGHLIGHTS

Results from completed projects and those nearing completion are becoming available at an ever-increasing rate. Some of the scientific findings and technological advances that have been reported are presented below by program area.

Apiculture/Entomology

Insects and microbiological agents can have both positive and negative effects on agriculture. To date, Farming for the Future projects have concentrated on refining methods for estimating and controlling insect populations and on developing a self-sustaining honey industry in Alberta.



Farming for the Future provided substantial funding for the Alberta Bee Breeding Program. This project has developed two strains of a new Alberta Bee — one for northern Alberta and one for southern Alberta. Under experimental conditions, the northern strain has produced up to 162 percent more honey than conventional honey bees and the southern strain, up to 111 percent more. In addition to their high productivity, these strains are disease resistant and have a superior ability to withstand Alberta winters. Increased overwintering will help the province's apiarists reduce the expensive practice of importing new bees each spring as well as lower the hazard of importing costly diseases. The bees are being tested by selected Alberta beekeepers before being placed in commercial use.

The black fly poses serious difficulties to cattle producers in northern Alberta. With Farming for the Future support, a black fly repellent for cattle has been formulated for use with an improved automatic sprayer. These should assist in reducing production losses and in expanding the cattle industry in northern Alberta.

In another Farming for the Future project, insect sex attractants have been refined and tested for use in monitoring populations of cutworms and armyworms. With better monitoring techniques available, researchers were able to predict a potentially serious outbreak of armyworms in southern Alberta in 1981. As a result, fields were sprayed early enough to prevent serious losses.

Techniques for efficient mass production and long-term storage of spores that specifically attack grasshoppers are being developed with financial assistance from Farming for the Future. If proven effective, use of biological grasshopper control will ease worries among beekeepers, livestock producers and forage growers who fear side effects from the use of chemical insecticides.

Cereals and Oilseeds

The major objectives behind Farming for the Future's cereals and oilseeds projects have been to breed higher yielding and more disease resistant varieties, to devise improved methods of weed control, to raise the nutrient content of feed cereals and to conduct extensive regional testing of cereal and oilseed varieties.

Farming for the Future projects have also emphasized better use of agricultural resources in northern Alberta. To deal with the region's shorter frost-free periods, researchers are striving to develop cultivars that mature quickly while producing yields comparable to those obtained further south.

In general, plant breeding projects require considerable time to produce crop varieties with desirable characteristics. With time, Farming for the Future plant breeding projects should lead to more productive crops for Alberta. One project has already resulted in the licensing of a new high yielding, early maturing variety of barley, Otal, designed for the Peace River region.

Results from a project on cereal and oilseed production management are enabling scientists to offer growers improved recommendations on varietal selection and harvesting techniques. In another Farming for the Future study, researchers found that barley with as much as 45 percent moisture content can be straight combined without yield losses. This can mean a seven to ten day reduction in growing time, an advantage which producers can use to increase their harvesting efficiency and to gain a head start in postharvest field work.

Forages

The availability of nutritious yet inexpensive forage has been important to the success of Alberta's cattle industry. To ensure the industry's future prosperity, it is essential that Alberta forage production remain competitive in both price and quality. To help, Farming for the Future has supported projects in such areas as disease resistance and control, brush control, optimum use of fertilizer, regional varietal testing, and harvesting and storage techniques.

Alfalfa plants are able to convert atmospheric nitrogen into a form that they can use with the help of certain types of soil bacteria called rhizobia. Inoculating the plants with rhizobia boosts the ability of alfalfa to "fix" nitrogen in the soil. With financial assistance from Farming for the Future, scientists have determined a better method of screening rhizobia for use in inoculants, found two new strains of the bacteria suited to soils in northern Alberta and developed a better method of applying inoculants. These results should improve alfalfa quality and should also help to replenish soil nitrogen for use by plants which cannot fix nitrogen.

In a province-wide testing program, several hundred licensed varieties and experimental lines of cereal, oilseed and pulse crops are being tested for their value as silage, hay or pasture. Researchers have determined which lines have high yields of digestible energy and protein and have developed recommendations for producers on how best to grow these crops for forage use.

Preliminary results from a long-term project indicate that high moisture silage can be cut and stored without danger of spoilage when sulphur dioxide is applied as a preservative. Furthermore, feeding trials have shown that the sulphur dioxide improves the nutritive quality of silage.

In still another project, Farming for the Future funds were used to adapt machinery to harvest higher quantities of light forage seeds while picking up fewer weed seeds. After the seeds are harvested with this machinery, high quality forage can still be obtained from the stand.

Irrigation

In 1982-83, the first projects under a new Farming for the Future program area in irrigation research were awarded funds. With more than one million acres under irrigation, Alberta has greater than 50 percent of all the irrigated land in Canada. However, agricultural productivity in southern Alberta could be further enhanced by improved and expanded irrigation techniques.

A heavy financial investment is required to rehabilitate existing irrigation canals, improve drainage systems and develop new irrigation schemes. To overcome a gap in scientific information and technology relevant to Alberta conditions, Farming for the Future projects are under way to test new canal lining materials and methods and to upgrade drainage standards. These projects are aimed at increasing water use efficiency and improving drainage to reduce damage from saline seepage in irrigated areas.

Other Farming for the Future projects include mapping lands affected by salinity and evaluating the economic viability of using wind turbines for pumping irrigation water.

Land Resources and Engineering

Farming for the Future is supporting many projects designed to enhance and improve the productivity of Alberta's land resource.

Ensuring that agricultural land remains productive is a constant challenge. Field crop production reduces the amount of nitrogen, phosphorus and other soil nutrients while overgrazing can cause pastures to be overrun with woody growth. Unchecked wind and water erosion can quickly reduce soil productivity anywhere in the province.

Current research nearing completion includes studies on methods of conserving soil nutrients, optimizing production on gray wooded soils, developing a hydrological model for the Peace River region and evaluating the effectiveness of snow management for moisture conservation.

Researchers in one major Farming for the Future project are assessing factors affecting crop utilization of nitrogen in soils, including how and when nitrogen fertilizer should be applied and the effects of different tillage procedures on soil nitrogen. Based on this research, recommendations have been prepared to help farmers preserve and improve the availability of this important crop nutrient.

Farming for the Future is supporting other projects evaluating zero and minimum tillage under various Alberta soil conditions. Advantages of these cropping methods such as moisture conservation, continuous cropping and reduced fuel use are being evaluated against disadvantages such as higher fertilizer and herbicide requirements. It appears that zero tillage can be advantageous in southern Alberta, especially in drier years or on sandy soils. However, in central Alberta, the technique may be unprofitable because of the high cost of chemicals needed to obtain weed control.

Non-Ruminants

Non-ruminant projects supported by Farming for the Future are investigating many factors affecting the productivity of swine, poultry, horses and rabbits. Studies are particularly concentrating on efficient use of feed and feed supplements, better disease control and greater use of domestic sources of high protein feed.

Preliminary results from one investigation show that up to 15 percent of soybean meal used in poultry feed can be replaced with domestic canola meal. In another Farming for the Future project, the protein portion of swine diets was evaluated to improve the information producers use in making their feed buying decisions and in formulating swine rations.

Leg problems account for almost one-third of all turkey losses. Researchers in another Farming for the Future study found that vitamin deficiencies in turkey feeds may be the cause of unexplained rickets and related diseases.

Processing, Transportation, Marketing and Socio-Economics

Agri-business remains a significant factor in the growth and expansion of Alberta's agricultural industry. Development of the province's processing, transportation and marketing sectors is vital to the long-term viability of agriculture. Farming for the Future has acknowledged this importance by allocating nearly $0.5 million over the last four years to this program area, with a further $325,000 being awarded for 1983-84.

Many Farming for the Future projects concern the processing of canola, reflecting the growing economic importance of this crop in Alberta. Canola is mainly consumed as cooking oil, shortening and margarine. With Farming for the Future support, researchers have investigated consumer acceptance of canola margarines in terms of taste, spreadability and texture. Nutritional aspects of canola products were also studied and recommendations have been made to improve their nutritional content during processing and to retain that value during consumer use.

In another Farming for the Future study, scientists working with an Alberta processor developed a recipe and a gas packaging technique which took the processor's crumpets out of the freezer and on to store shelves and extended their shelf life from four days to 26. The lower storage and transport costs resulting from the new process allowed the company to expand into new markets, to increase its staff by one-third and to increase production fourfold.

Other Farming for the Future projects under way in this area are dealing with the use of egg lipid in infant formulas, the compositional analysis of honey and the evaluation of beef quality.

Ruminants

Ruminants constitute one of the chief sectors of Alberta's agricultural industry. Considering that 80 percent of Alberta beef is destined for out-of-province markets, the price and quality of Alberta livestock must remain competitive.

One aid would be reduction of the death rate among young animals. Farming for the Future is helping by supporting studies that are investigating ways to reduce the incidence of scours in calves and lambs. Scours cost producers millions of dollars each year through death, poor growth, veterinary bills and lost time. One project has produced a commercial vaccine against a type of scours and several studies are close to producing vaccines against other forms of scours. Another project is concentrating on the introduction of beneficial bacteria into the digestive tracts of young ruminants to replace the harmful bacteria which cause scours.

Many producers are concerned about the effects of cold weather stress on cattle. One Farming for the Future project showed that cattle can survive by eating snow if there is no drinking water. Another study developed recommendations for livestock shelters so that growth and feed efficiency are maintained in cold weather.

With financial help from Farming for the Future, techniques for removing calf embryos, freezing them in liquid nitrogen for storage and transportation, and reimplanting them in recipient cows were successfully tested. This simplifies the international exchange of breeding stock since embryos can be easily and conveniently transported. It also permits better utilization of superior cows and allows control of calving time. In another Farming for the Future project, work is in progress on splitting embryos in order to produce identical twin calves.

Other projects supported by Farming for the Future in the ruminant area involve cattle breeding, nutrition, reproduction and management.

Special Crops

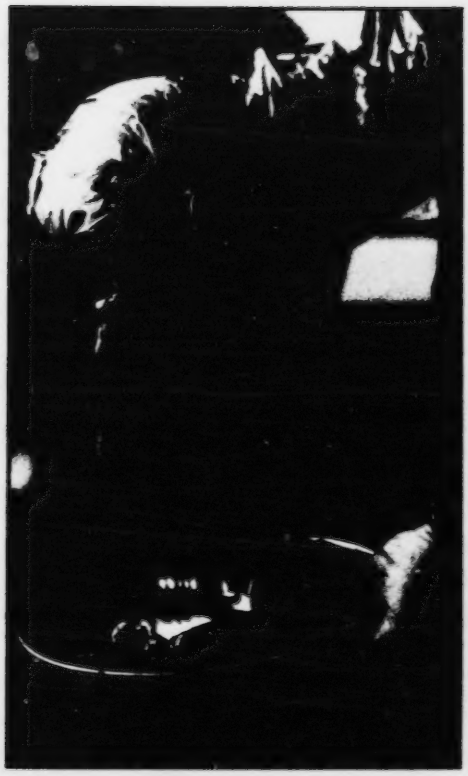
Special crop production is important to the continuing diversification of Alberta's agricultural industry. Sales of crops such as potatoes, cabbages, sugar beets, sunflowers, peas, beans and greenhouse products add up to millions of dollars annually. Farming for the Future is assisting expansion of this production area through support of research in disease control and development of varieties specifically suited to Alberta conditions.

Farming for the Future provided financial assistance to an investigation which established the significance of root diseases in peas and beans and evaluated methods of their control. The results provided producers with better information on disease control which helped improve the yield and quality of pulse crops.

Plant diseases annually cost Alberta's greenhouse industry thousands of dollars. For this reason, Farming for the Future helped support greenhouse disease research at the Alberta Horticultural Research Center. An integrated control program involving fungicides, crop management and sanitation was developed to overcome grey mold on cucumbers. In addition, several experimental fungicides and nematicides were found to be effective against greenhouse plant diseases and could possibly replace older, less effective products in the near future.

Summary

These highlights from Farming for the Future's extensive Research Program represent only a small fraction of the results generated since the program's inception. Final reports from all the research projects undertaken during the first five years of the program are due in March 1984.



In January 1982, the Agricultural Research Council of Alberta established the On-Farm Demonstration Program to intensify and accelerate the transfer of new technology from researchers to producers. To meet this aim, the program specifically encourages producers and producer organizations to become involved in regional on-farm testing and demonstration of innovative farm technology. Alberta Agriculture's regional and district staff and experts in specific technological fields work with co-operating producers in managing projects that introduce new research results. The projects also provide a means of utilizing the knowledge, skills and initiative of co-operating producers for the benefit of farmers in the region.

Any producer or farm organization with an innovative idea for a demonstration that could benefit farmers can apply for a grant through the local district agriculturist. The applicant, the district agriculturist and other members of the project team develop the proposal for submission to one of the six regional review committees appointed by the Minister of Agriculture. Each regional review committee is composed of the regional director (who acts as chairman), Alberta Agriculture staff and producers appointed by the Minister of Agriculture. The regional committee reviews the proposal, makes a recommendation and forwards it to the Secretary of the Agricultural Research Council of Alberta for a final decision.

Each application is evaluated on the basis of:

a) the potential contribution or significance of the demonstration to the region's agricultural industry;

b) the competence and experience of the project team;

c) the organizational capability and commitment of the producer to complete the project;

d) the validity of the project design and demonstration plan; and

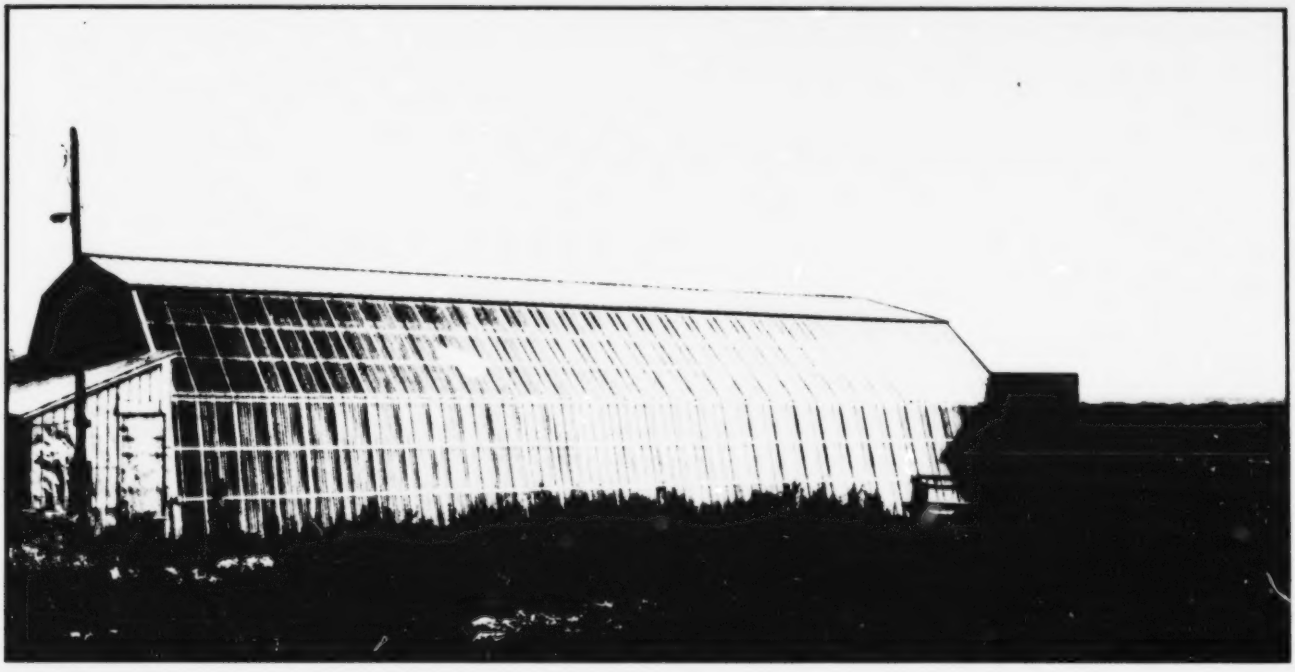
e) the size, duration and cost of the proposal.

Approved funds can be used to lease and/or purchase equipment and supplies, obtain data analysis, hire project labour or undertake travel in connection with the project. When the project is completed, the project team submits a report to the ARCA so that the methods used and the results obtained can be made available to those interested.

The On-Farm Demonstration Program has proven to be very popular, especially among producers interested in developing and adopting new technology. In 1982-83, 47 projects received total funding of $166,000 and one project was initiated at the producer's expense.

ON-FARM DEMONSTRATION PROGRAM HIGHLIGHTS

Across Alberta, Farming for the Future on-farm demonstration projects such as the following examples are offering producers visible examples of practical alternatives or improvements to current management practices.



At Schwanke Farms near Sangudo, Alberta, a novel project is assessing the use of solar energy in grain drying. Early harvesting of grain may reduce the risk of snow damage to crops; however, the grain must then be dried using natural gas or other fossil fuels, a costly undertaking. Use of solar energy for grain drying may be an economical alternative, so Mr. Schwanke is testing this system under central Alberta conditions.

Use of plastic tunnels presents great potential for improving production from cucumber plants. In evaluating this technology, Robert and Bernice Grey of Fort McMurray have grown cucumber plants which produce almost three times as much fruit as those grown in the open. The clear plastic tunnels, which cover the plants until they blossom, increase the temperature of the surrounding air, promoting growth. The tunnels also provide some protection against late spring frosts. In addition, the Greys use black plastic to cover the soil surface to help conserve soil moisture and limit weed growth.

Because of their sexual aggressiveness, bulls present producers with special management problems, including bruised and dark-cutting carcasses. Yet, properly managed bulls can gain weight faster and more efficiently than steers. Limited data indicate that Ralgro implants suppress sexual aggressiveness in fed bulls, a management technique which Ty Lund of Alhambra is investigating. His preliminary results indicate that implanted bulls have improved weight gains and that dark cutting and bruising are reduced in the carcasses.

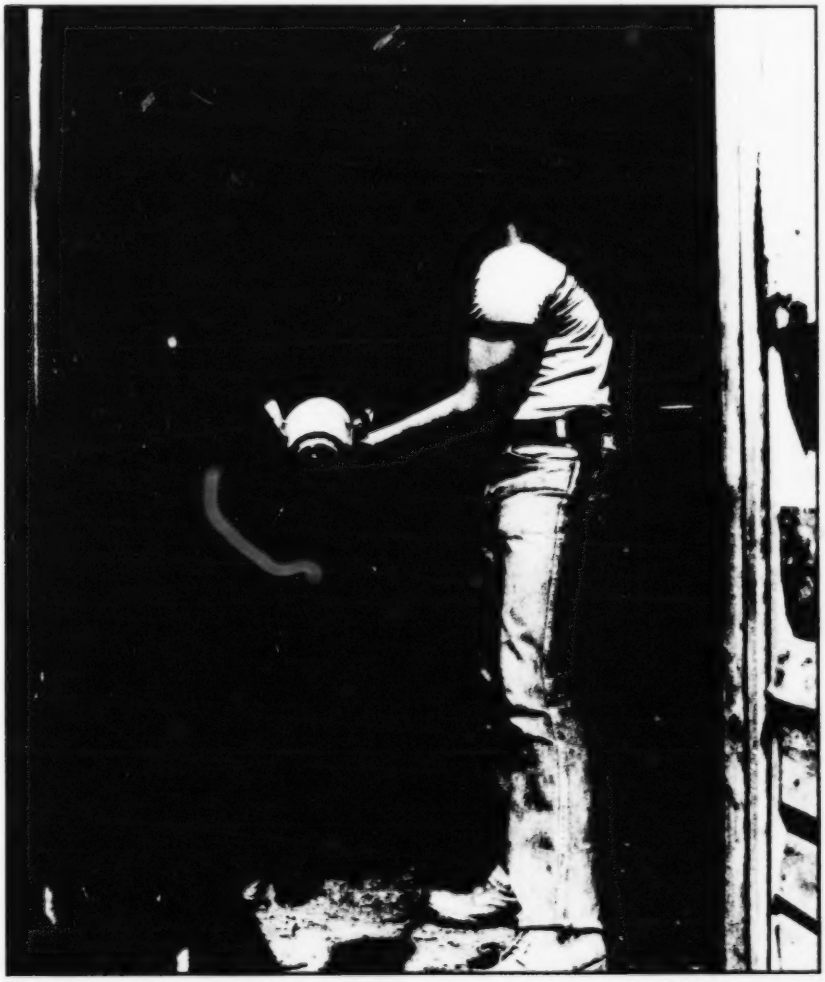
Near Bow Island, Al Coutts has developed a project to evaluate warm treatment of swine manure. Solid/liquid separation is a key part of the process. The solid component can be used for refeeding while the liquid portion is suitable for land application by sprinkler irrigation. This method of manure treatment and handling has high potential for intensive livestock and poultry operations. It offers the possibility of better odor control with maximized utilization of manure nutrients. Both offer economic advantages as environmental and land pressures grow and as the cost of chemical fertilizers increases.

NOTE: The numbers following some locations indicate the number of projects at those locations. All other locations have only one project each.

The number of locations shown exceed the number of projects in progress due to some projects being carried out at more than one site.

The Graduate Student Research Support Program was established in January 1982 to help improve the number and the quality of graduate students available for future postgraduate research in the agricultural sciences. The program provides one-time grants of up to $10,000 to help graduate students at Alberta universities and the Western College of Veterinary Medicine in Saskatoon to cover their individual research costs. The objectives of the program are to contribute to the training of increased numbers of agricultural scientists, to enable graduate students to undertake meaningful agricultural research and to enhance and promote the advancement of agricultural sciences by supporting basic research conducted by graduate students.

The first review of proposals took place in July 1982. Of the 28 proposals reviewed, 17 were funded at a total cost of $117,350. Awards were given to two graduate students at the Western College of Veterinary Medicine and to 15 graduate students at the University of Alberta in the departments of Animal Science, Foods and Nutrition, Rural Economy, Genetics and Agricultural Engineering. These studies are expected to be completed by August 1983.



The mandate of Farming for the Future is to support and promote research efforts that will ultimately improve the competitive advantage of Alberta's agricultural products in the marketplace. To this end, this research must meet two aims: to solve problems unique to Alberta's geographic and economic conditions and to increase the producers' ability to make the best possible use of the province's natural advantages.

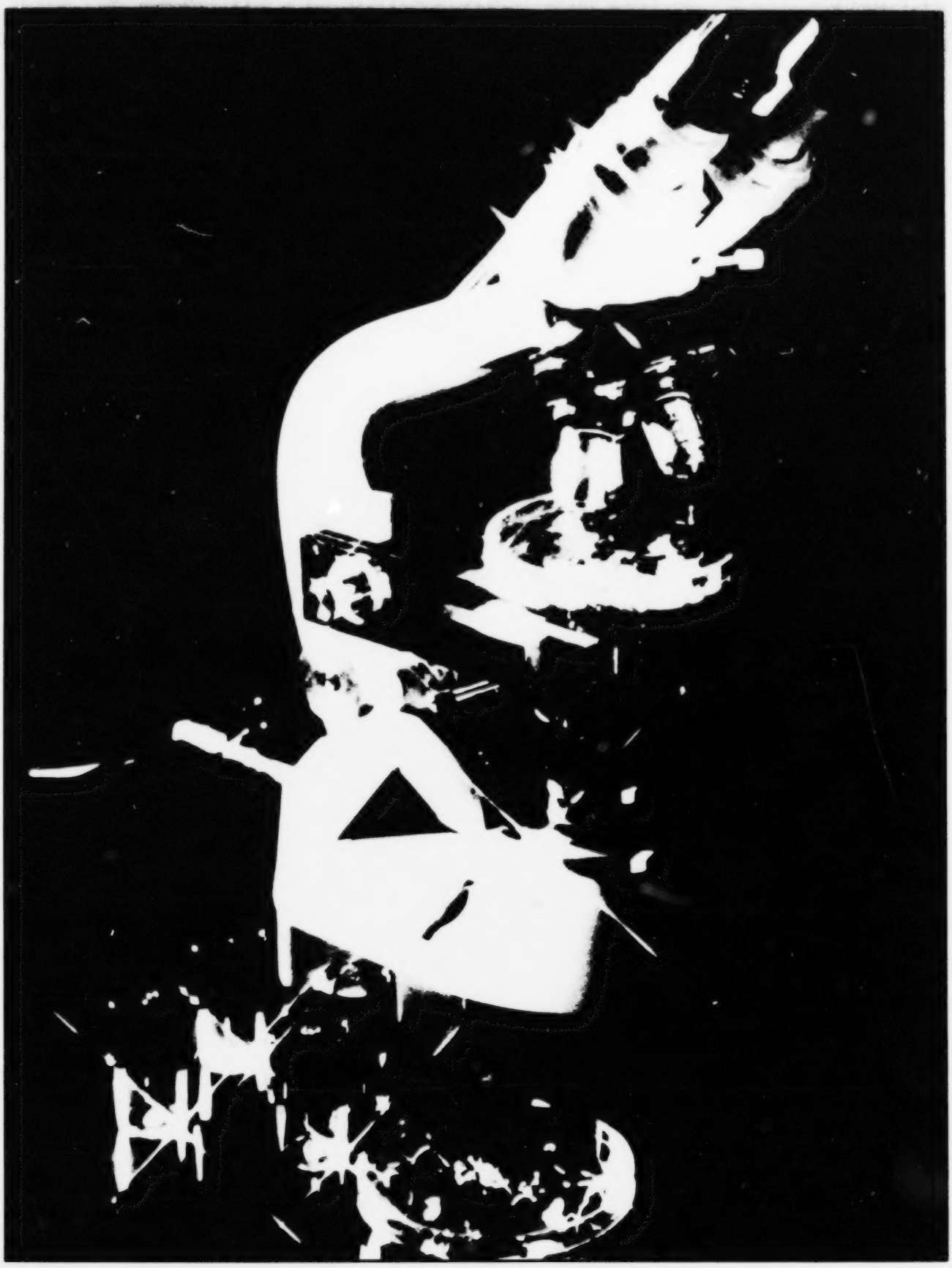
Diversity in research is one way to success. Long-term priorities for conducting agricultural research in Alberta should include increasing research efforts in forage production and utilization, development of user-friendly software for livestock management systems, development of canola varieties uniquely suited to our range of growing conditions, manipulation of reproductive functions to improve livestock productivity and development of new biotechnology for livestock disease control and crop protection.

Over the long term, fundamental research in plant and animal physiology and biochemistry is essential if the foundation of basic agricultural knowledge is to be maintained or expanded. In difficult economic times, strategies to ensure the maintenance of the family farm have an important place in a wide ranging research program. As agricultural use of Alberta's land base comes under increasing pressure from competitive alternate uses, conservation and development of farmland and maintenance of soil fertility are crucial to protecting the future of the agricultural sector.

Considering the province's present economic climate, wise use of available research dollars is mandatory. Innovative research conducted in the private sector as well as in federal, provincial and academic institutions will directly affect the future success of Alberta's agricultural industry. The Agricultural Research Council of Alberta expects to continue to direct Farming for the Future support to well designed, sharply focussed projects relevant to Alberta's agricultural industry. It is the results of these projects in terms of the everyday agricultural industry that will determine the ultimate success of Farming for the Future.

The On-Farm Demonstration Program, after just a single year of operation, has proven to be an effective and efficient means of accelerating the transfer of technology from the research lab to the farm. This vital connection should be continued and expanded in the future.

Overall, Farming for the Future is proving to be one of the most complete agricultural research support programs in the world, sponsoring activities that range from laboratory research to testing and demonstration of that research on the farm. The ultimate goal is to improve the effectiveness and efficiency of our food system so that consumer prices can be kept at reasonable levels while still providing the agricultural industry with an equitable profit.



Apiculture/Entomology

Alberta Bee Breeding Program • to breed for Alberta climatic conditions a bee that displays superior docility, overwintering ability, honey production and disease resistance	T.I. Szabo	Agriculture Canada — Beaverlodge, on behalf of the Alberta Beekeepers' Association	703,600	200,000
Insect Sex Attractant Systems to Monitor Crop Pests • to develop methods for forecasting outbreaks of the bertha armyworm and seven cutworm species	J.R. Byers	Agriculture Canada — Lethbridge	154,960	47,000
Commercial Package Bee Production in Northern Alberta • to promote commercial production of overwintered package bees in northern Alberta	H.J. Pirker	Pirker Apiaries — Debolt	17,500	completed
Studies Toward the Prevention of Anaphylactic Sensitization to Bee Stings • to study and identify the factors which cause some people to become hypersensitive to bee stings	M.F. David	University of Manitoba — Winnipeg	59,300	in progress
Protecting Cattle Against Blood-Sucking Flies • to develop for on-farm use insect repellents that protect cattle against blood-sucking flies	J.A. Shemanchuk	Agriculture Canada — Lethbridge	59,565	completed
Development of *In vitro* Techniques for Mass Production of Infective Spores of *Nosema locustae* Canning (Microsporida) to be Used in the Management of Grasshopper Populations • to develop tissue culture methods for mass producing and procedures for long-term storage of *Nosema locustae* spores to be used in controlling grasshoppers in rangeland, cereal crops and forage seed fields	A.B. Ewen	Agriculture Canada — Saskatoon	69,400	in progress
Assessment of the Role of Plant Chemicals in Repelling and Deterring Feeding of Flea Beetles • to assess the inhibiting role played by the chemical makeup of plants such as stinkweed in deterring feeding by flea beetles	B.K. Mitchell	University of Alberta	26,500	completed
Clinical and Immunological Assessment and Management of Risk in Honey Bee Sting Sensitivity • to uncover trends in the occurrence of and methods for preventing hypersensitivity to bee stings among people involved in the honey industry	J.H. Day	Queen's University — Kingston	97,000	41,000
Damage Assessments and Control of Lygus Bugs in Canola Grown in Alberta • to determine the extent of damage done by lygus bugs to the flowers, buds and seeds of canola in order to establish the most effective time for control spray applications	R.A. Butts	Alberta Agriculture — Fairview		10,500
Identification of Pest Species of the *Simulium arcticum* Complex Present in the Athabasca River and Associated Tributaries • to determine which of the black flies in the above-named group are pests to cattle and to establish their spatial distribution for improved control	W.S. Procunier	Agriculture Canada — Lethbridge		28,400
Microbiological Control of Western Agricultural Insect Pests by Insect Parasitic Nematodes • to see how effectively naturally occurring parasites that live in the soil can control the larvae of certain insect pests under field conditions	O.N. Morris	Agriculture Canada — Winnipeg		23,600

Feasibility Study for Control of Root Maggots (*Delia* spp.) on Canola • to provide basic information on root maggot activity in canola in order to develop effective control methods	G.E. Ball	University of Alberta		30,700
Oviposition Preference and Behavior in the Bertha Armyworm • to discover whether bertha armyworms prefer to lay their eggs at a particular stage of canola flower development, with a view to developing better control methods	B.K. Mitchell	University of Alberta		28,000
Cereals and Oilseeds				
Regional Testing of Cereal and Oilseed Varieties in Alberta • to provide performance and adaptability information on barley, wheat, oats, canola and flaxseed varieties	J.H. Helm	Alberta Agriculture — Lacombe, in cooperation with other agencies	625,000	196,000
Screening Winter Wheat for Resistance to Snow Mold Pathogens under Controlled Conditions • to develop methods for screening varieties of winter wheat that are resistant to snow mold in cool growing conditions	D.A. Gaudet	Agriculture Canada — Lethbridge	71,700	20,250
Utility Wheat Varietal Development Program • to produce utility wheat varieties adapted to the climatic conditions of central and northern Alberta	K.G. Briggs	University of Alberta	327,300	95,669
Field Trial Agronomic Research in Field Crop Production • to study the production and management problems of high moisture grain under Alberta conditions	J.H. Helm	Alberta Agriculture — Lacombe	50,000	completed
Intensification of Breeding Barley Varieties for the Peace River Region • to identify high yielding, early maturing barley lines adapted to the Peace River region	R.I. Wolfe	Agriculture Canada — Beaverlodge	157,525	52,000
Intensification of Rapeseed (Canola) Breeding in the Peace River Region • to identify early maturing Argentine and higher yielding Polish canola lines adapted to conditions in the Peace River region	R.S. Sadasivaiah	Agriculture Canada — Beaverlodge	75,850	24,000
Disease Resistance Selection in Early Maturing Barley, Rapeseed (Canola) and Wheat • to develop disease resistant, early maturing varieties of barley, canola and wheat adapted to northern Alberta conditions	R.I. Wolfe	Agriculture Canada — Beaverlodge	120,930	50,000
Intensification of Wheat Breeding in the Peace River Region • to breed earlier maturing utility wheats suitable for use in northern Alberta	R.I. Wolfe	Agriculture Canada — Beaverlodge	99,900	35,000
Development of Agronomic Packages for Barley, Rapeseed (Canola), Wheat and Oat Varieties in the Peace River Region • to help farmers in northern Alberta maximize returns from cereal and oilseed production and to aid the introduction of early maturing varieties to northern Alberta	R.I. Wolfe	Agriculture Canada — Beaverlodge	348,500	80,000

Disease Resistance Breeding in Rapeseed (Canola) • to develop disease resistance in canola varieties suitable for production in Alberta	Z.P. Kondra	University of Alberta	206,500	65,500
Early Maturity and Frost Tolerance of Rapeseed (Canola) • to identify canola types which mature very early in cool growing conditions and to evaluate the effect of sub-freezing temperatures on canola plant growth and seed quality	Z.P. Kondra	University of Alberta	128,500	26,000
Weed Control in Alberta Cropland • to provide better methods for controlling several of Alberta's major weeds, including Canada thistle, perennial sow thistle and cleavers	W.H. Vanden Born	University of Alberta	228,641	81,400
Canada Thistle Control • to develop effective chemical and integrated cultural/chemical control measures for Canada thistle	P.A. O'Sullivan	Agriculture Canada — Lacombe	93,570	35,000
Biological Evaluation of Advanced Selections of High-Lysine Barley Produced in Alberta Agriculture's Feed Grain Breeding Program • to produce a high-lysine barley with a yield similar to that of varieties already grown in Alberta	R.M. Beames	University of British Columbia — Vancouver	37,500	in progress
Field Trial Agronomic Research in Special Crop Production for Central Alberta • to identify and adapt crop varieties with the intent of diversifying crop production in central areas of Alberta	J.H. Helm	Alberta Agriculture — Lacombe	110,000	completed
Expansion of Winter Wheat, Winter Triticale and Spring Triticale Breeding in Central Alberta • to develop winter wheat and winter and spring triticale varieties that are adapted to central Alberta	Donald Salmon	Alberta Agriculture — Lacombe	102,000	34,000
Breeding Soft White Spring Wheats for Western Canada • to develop superior varieties of soft white spring wheat for the irrigated areas of Alberta and Saskatchewan	J.B. Thomas	Agriculture Canada — Lethbridge	135,440	59,000
A Study of Bacterial Pod Spot and Other Diseases Caused by *Pseudomonas* sp. in *Brassica campestris* • to establish methods for controlling diseases caused by the bacteria *Pseudomonas* in Alberta canola	J.N. Campbell	University of Alberta	63,040	completed
Application of Haploid Technique to Barley Breeding • to produce barley haploids for use in Alberta barley breeding programs	John Kuspira	University of Alberta	136,600	completed
Development of Hybrid *Brassica campestris* Varieties for Alberta and Northern Saskatchewan • to test the feasibility and economics of producing hybrid canola varieties	R.K. Downey	Agriculture Canada — Saskatoon	128,985	47,200
Whole Plant Utilization of Brassicas • to study the use of canola as a livestock greenfeed and its feed value when affected by frost	J.R. Ingalls	University of Manitoba — Winnipeg	51,300	in progress
Weed Competition with Cereal and Oilseed Crops • to develop mathematical models for predicting producer losses resulting from competition of various weed species with barley, canola, oats and wheat	P.A. O'Sullivan	Agriculture Canada — Lacombe	52,300	55,000
Minimizing Herbicide Application Rates by Adding Adjuvants for Weed Control in Annual Crops • to assess the use of surfactants and inorganic additives in reducing herbicide application rates and costs	P.N.P. Chow	Agriculture Canada — Brandon	31,000	in progress

Increasing Frost Tolerance in Economic Crops by Abscisic Acid • to determine if the frost hardiness of economic crops can be increased by the application of abscisic acid or related compounds, and to determine the most effective method of applying one of these compounds	L.V. Gusta	University of Saskatchewan Crop Development Centre — Saskatoon		30,000
Management Practices for Winter Wheat Production in Central Alberta • to compare winter wheat survival rates under zero tillage and conventional tillage with reference to effects of herbicide, fungicide and fertilizer applications	C.D. Caldwell	Agriculture Canada — Lacombe		37,000
Identification of Irrigation Practices that Reduce Black Point in Soft White Spring Wheat • to determine if the modification of certain irrigation practices will reduce the occurrence of black point in soft white spring wheat	R.L. Conner	Agriculture Canada — Lethbridge		13,500
Comparison of Zero, Minimum and Conventional Tillage Management Practices on Various Soil Types for Barley and Canola Production in the Peace River Region • to compare various tillage practices to establish how soil type affects tillage practice, grain yield and weed response	G.W. Clayton	Agriculture Canada — Fort Vermilion		40,000
Acceleration of Canola Variety Development for the Peace River and Southern Alberta Regions • to develop better high yielding, disease resistant canola varieties adapted to northern Alberta and to both dryland and irrigated regions of southern Alberta	R.K. Downey	Agriculture Canada — Saskatoon, Beaverlodge and Lethbridge		875,000
Forages				
Evaluation of Sulphur Dioxide (SO_2) as a Silage Preservative • to establish the practicality of using SO_2 on a farm scale to preserve high moisture grain and to enhance the rate of drying of forage cut for hay	G.W. Mathison	University of Alberta and Alberta Research Council	249,200	40,600
Viruses and Virus-Related Diseases of Forage Crops in Alberta — Evaluation and Control • to develop and evaluate practical control measures against diseases of economically important forage crops in Alberta	Chuji Hiruki	University of Alberta	128,500	completed
Smooth Bromegrass Breeding Program • to breed high yielding strains of smooth bromegrass that are adapted to Alberta climatic conditions	P.D. Walton	University of Alberta	70,200	completed
Alfalfa Improvement Program for Disease Resistance • to improve the productivity and yield of alfalfa by reducing losses due to foliage, root and crown diseases	Chuji Hiruki	University of Alberta	224,800	80,000
Annual Forage Crops for Alberta • to identify crops and crop species and management and fertilizer practices which can be used to maximize Alberta forage production	W.B. Berkenkamp	Agriculture Canada — Lacombe, coordinating a province-wide program involving several agencies	461,200	157,848
An Investigation of the Properties of Liquid Silage Additives and Techniques to More Accurately Apply Additives to Forage and Silage Crops • to determine better methods for applying preservative and nutritive additives to forage and silage with machinery	W.H. Mains	Agriculture Canada — Lethbridge	29,200	completed

Development of Improved Forage Crop Production, Harvesting and Utilization Techniques for the Aspen Parkland of Western Canada (and) Preservation of High Moisture Hay • to investigate the use of anhydrous ammonia for the preservation of high moisture alfalfa and bromegrass hay	S.O. Thorlacius	Agriculture Canada — Melfort	10,000	completed
Chemical Control of Stem Eyespot of Creeping Red Fescue • to develop a chemical control for stem eyespot disease	J.G.N. Davidson	Agriculture Canada — Beaverlodge	95,200	31,000
Alfalfa Productivity and Yield as Affected by Management Practices and Environmental Factors • to determine the optimum fall cutting dates for alfalfa in relation to yield potential, environmental conditions and winter survival in the upper and lower districts of the Peace River region	J.S. McKenzie	Agriculture Canada — Beaverlodge	139,000	in progress
Evaluation of the Nitrogen-Fixing Effectiveness of Selected Strains of *Rhizobium* and Seed Inoculation Methods for Several Forage Legumes • to increase nitrogen fixation by forage legumes grown in northern Alberta	W.A. Rice	Agriculture Canada — Beaverlodge	123,900	completed
A Comparison of Brush Control Methods for the Development and Maintenance of Grazing Lands • to study the effectiveness of various brush control methods and to compare their costs against their returns	A.W. Bailey	University of Alberta	244,500	54,250
The Effect of Fertilizer Treatments on the Nutritional Value of Forages • to study the effects of fertilizer on forage nutrient yield and to formulate recommendations for fertilizer application	P.J. Martin	Norwest Feed Research Ltd. — Edmonton	73,400	completed
Effect of Weed Control on the Establishment and Persistence of Legumes • to determine the effects and benefits of controlling weeds in seedling alfalfa, sainfoin and cicer milkvetch	J.R. Moyer	Agriculture Canada — Lethbridge	57,700	completed
Agronomic Research and Regional Variety Testing of Forage Varieties Recommended in Alberta • to obtain performance and adaptability data on forages and to provide new technology for maximizing forage yields	Felix Mederick	Alberta Agriculture — Lacombe, in cooperation with several agencies	420,000	85,000
Weed Control in Forage Grasses • to develop new methods for controlling weeds during the establishment of forage grasses	A.L. Darwent	Agriculture Canada — Beaverlodge	40,800	15,200
Minimizing Nitrogen Losses from Urea Applied to Grassland • to assess the relative losses of ammonia applied to the surface of bare soil and grassland	M.J. Rowell	Norwest Soil Research Ltd. — Edmonton	45,000	completed
Development of a Winter-Hardy, 'Bloat-Safe' Pasture-Type Alfalfa Cultivar for the Rancher and Farmer of Western Canada • to develop a 'bloat-safe' alfalfa variety to allow western farmers to utilize the greater cattle carrying capacity of alfalfa pastures	B.P. Goplen	Agriculture Canada — Saskatoon	61,430	40,150
Stress Tolerance in Orchardgrass Breeding • to investigate stress tolerance in orchardgrass and to select varieties with specific stress-resistant factors	E.A. Clark	University of Alberta	89,200	48,420

Control of Brush Regrowth by Applying Herbicide with Roller and Wick Applicators • to assess roller- and wick-type herbicide applicators in controlling woody regrowth on pastures	John Waddington	Agriculture Canada — Melfort	35,000	13,400
Chemical Control of Pasture Sage (*Artemesia frigida*) • to evaluate chemicals used to control pasture sage and to determine the long-term economic viability of their use	D.R. Westerlund	Chinook Applied Research Association — Oyen	12,000	completed
Use of Ethylene for Control of Germination of Dormant Weed Seeds in Alberta Soils • to study ethylene's possible role in stimulating germination of dormant weed seeds, thereby reducing the number of herbicide applications required during the growing season	M.E. Spencer	University of Alberta	30,000	33,000
Use of Plant Growth Regulators to Improve the Quality of Forages Grown in the Peace River Region of Alberta • to establish the effects of chemical plant growth regulators on quality characteristics of common forage crops	D.C. Buck	Fairview College — Fairview	17,400	13,100
Study of Energy Requirements of the Various Components of Forage Harvesting, Storage and Utilization Systems • to study the energy consumed in major aspects of forage production as a basis for comparing the energy costs of producing hay and silage rather than cereals and oilseeds	En-Zen Jan	Agriculture Canada — Melfort	36,000	28,500
Alfalfa Seed Production in the Peace River Region • to assess how alfalfa yields are influenced by the age of stands and the management of leafcutting bees	D.T. Fairey	Agriculture Canada — Beaverlodge	25,000	40,250
Development of a Specialty Harvester for a Variety of Crops • to develop and test a machine capable of harvesting crops having very light seeds or easily shattered heads	F.A. Rousell	Vertec Industries Ltd. — Vermilion	35,000	completed
Sulphur Dioxide (SO_2) Application System • to improve the function and durability of systems for applying SO_2 to forage	H.P. Harrison	University of Alberta	40,000	48,700
Role of Additives in Preservation of Hay in Central Alberta • to determine the amount of preservative to be added to high moisture hay to prevent loss of quality and dry matter, and to assess methods of application	V.S. Baron	Agriculture Canada — Lacombe		30,000
Weed Control in Alfalfa for Seed Production • to assess the effectiveness of various herbicides in controlling weeds in alfalfa, and to see how much row spacing affects seed yield and weed growth	J.R. Moyer	Agriculture Canada — Lethbridge		30,000
Alternative Systems of Management for Grass-Legume Forage Crops • to evaluate the strip-culture method of growing grass-legume forage crops and to see if it is more productive than the conventional mixed stand	N.A. Fairey	Agriculture Canada — Beaverlodge		33,575
Enhanced Field Drying of Alberta Forages • to compare rates of forage drying using chemical drying agents, mechanical treatments and agronomic treatments in order to improve field drying of alfalfa and red clover	E.A. Clark	University of Alberta		42,000

***Rhizobium* Strain Selections and Improvement of Legume Inoculants for Northern Alberta** • to develop strains of inoculant with an improved capacity to fix nitrogen in clover and alfalfa in northern Alberta	W.A. Rice	Agriculture Canada — Beaverlodge		53,000
Alfalfa Productivity as Affected by Dates of Fall Cutting Management • to determine the effect of fall cutting dates on yield and winter survival of four alfalfa varieties	J.S. McKenzie	Agriculture Canada — Beaverlodge		18,000
Irrigation				
Economical and Relatively Impermeable and Durable Rigid Canal Lining for Southern Alberta Environment • to evaluate three types of canal linings for their durability, seepage control and maintenance requirements (A cooperative program undertaken with the Alberta Irrigation Council)	Svat Jonas	Alberta Agriculture — Lethbridge and the University of Calgary — Calgary	78,000	15,000
Development of 'Optimum' Subsurface Drainage Depth and Spacing Criteria for Medium- to Fine-Textured Soils within Irrigated Alberta • to establish guidelines for determining the best depth and spacing for subsurface drains to reclaim salinized and waterlogged land under irrigation (A cooperative program undertaken with the Alberta Irrigation Council)	D.B. Harker	Alberta Agriculture and Agriculture Canada — Lethbridge, and the University of Alberta	76,000	31,315
Development of a Computerized Classification System Utilizing LANDSAT Digital Data to Detect, Map and Monitor Saline/Waterlogged Areas under Irrigation • to develop a computerized procedure capable of repetitively monitoring the location and size of saline/waterlogged areas (A cooperative program undertaken with the Alberta Irrigation Council)	D.B. Harker	Alberta Agriculture — Lethbridge	42,000	in progress
Evaluation of Low Volume Wind Turbines for Pumping Water • to evaluate the economics and efficiency of using wind turbines to pump water on drainage and irrigation projects in Alberta (A cooperative program undertaken with the Alberta Irrigation Council)	B.A. Paterson	Alberta Agriculture — Lethbridge, in conjunction with a number of other agencies	59,000	24,220
Evaluation of Cutoff Curtains for Seepage Control on Irrigation Canals in Southern Alberta • to evaluate the feasibility of using plastic cutoff curtains to control seepage from irrigation canals (A cooperative program undertaken with the Alberta Irrigation Council)	N.E. Jensen	C.W. Farmland Reclamation Ltd. — Olds	15,000	6,900
The Application of New Geophysical Instrumentation and Computer Mapping Techniques to Diagnose, Map, and Monitor Saline Soils • to assess the effectiveness of using new techniques for determining soil salinity and new methods of computer mapping as tools in monitoring saline soils	A.E. Osborne	Monenco Consultants Ltd. — Calgary		63,300
Farmland Drainage in Central and Northern Alberta • to examine wetlands in central and northern Alberta in order to determine drainage feasibility, and to develop a system of assessing costs and benefits	L.A. Leskiw M.S. Anderson	Pedology Consultants with Marv Anderson & Assoc. Ltd. — Edmonton		50,000

Land Resources and Engineering

Zero Tillage in Alberta • to evaluate the feasibility of zero tillage as a cropping practice under different soil types and textures	P.A. O'Sullivan	Agriculture Canada — Lacombe and Lethbridge	278,380	102,500
Making the Most of Nitrogen • to examine, evaluate and develop solutions to those factors that contribute to soil and fertilizer nitrogen losses	D.H. Laverty	Alberta Agriculture — Edmonton, coordinating the work of a number of agencies	666,280	238,880
Development of Agricultural Subsurface Drainage Design Procedures for Alberta • to provide essential information for land classification and preliminary data necessary for establishing provincial drainage standards	H.S. Vander Pluym	Alberta Agriculture — Lethbridge, coordinating a joint project involving a number of agencies	2,000	dis-continued
Fertility Management of Mixed Forage Stands • to study methods of achieving maximum performance from fertilizing practice	J.T. Harapiak	Western Co-operative Fertilizers Ltd. — Calgary	98,800	in progress
A Hydrologic Model for Soil/Land Management in the Peace River Region • to develop a model that will help producers in northern Alberta handle excess surface soil water and soil erosion	D.S. Chanasyk	University of Alberta	188,700	66,500
Production Optimization on Gray Wooded Soils • to provide producer and extension information on management techniques that optimize production from gray wooded soils	J.A. Robertson	University of Alberta	137,000	63,000
Development of Agricultural Subsurface Drainage Design Standards for Alberta • to determine drainage characteristics of southern Alberta drylands in order to establish drainage design standards	H.S. Vander Pluym	Alberta Agriculture — Lethbridge, in conjunction with the University of Alberta and Agriculture Canada — Edmonton	142,000	60,000
Conservation of Land Productivity in Alberta • to study erosion processes and losses in organic matter, nutrients and tilth in Alberta cultivated soils	W.B. McGill	University of Alberta	116,000	54,000
Land Price Escalation in Alberta: Economic Causes and Implications • to outline and analyze economic forces in rising Alberta land prices and to assess their impact on the agricultural community	M.M. Veeman	University of Alberta	31,965	15,000
Slough and Wetland Management in North Central Alberta • to develop technology and financial strategies for initiating production from central Alberta wetlands	L.P. Apedaile	University of Alberta	35,700	completed
An Evaluation of the Effectiveness of Snow Management for Moisture Enhancement • to evaluate snow management techniques such as snow trap swathing and alternate stubble heights for improving the springtime level of soil moisture in central Alberta	D.S. Chanasyk	University of Alberta	1,500	5,400
Improving Phosphorus Fertilizer Recommendations • to arrive at a method of determining available phosphorus which might not be detected by the usual soil analysis methods in order to improve phosphorus fertilizer recommendations	John Ashworth	Norwest Soil Research Ltd. — Edmonton		17,600

An Investigation of Hydrogeological Processes Influencing Dryland Salinity • to identify the processes causing saline seep problems and to use this information to develop effective management controls	G.M. Gabert	Alberta Research Council		145,000
Non-Ruminants				
Rapeseed (Canola) Meal Studies • to study the nutritional aspects of replacing soybean meal with canola meal in livestock and poultry rations	A.R. Robblee	University of Alberta	217,000	67,000
Improving Sow Productivity • to improve management practices for pregnant and lactating sows and for the care of piglets immediately after farrowing and weaning	F.X. Aherne	University of Alberta	135,750	completed
Alternate Protein Sources for Swine • to improve swine ration management by determining available levels of amino acids in feeds and maximizing the use of synthetic amino acids	W.C. Sauer	University of Alberta	149,000	completed
A Study of Transport Deaths in Market Weight Pigs in Saskatchewan • to determine the types and intensity of stress placed on pigs in transit	E.G. Clark	Western College of Veterinary Medicine — Saskatoon	6,860	completed
Influence of Dietary Factors on the Incidence of Unexplained Rickets and Related Leg Weakness Problems in Turkeys • to determine how nutritional factors such as vitamin D affect bone development and foot and leg problems in turkeys	Robert Blair	University of Saskatchewan — Saskatoon	45,000	27,000
Nutritional Studies in Horses • to study nutrition in the development of growing horses and in raising large numbers of horses under drylot conditions	N.F. Cymbaluk	Western College of Veterinary Medicine — Saskatoon	43,000	20,000
Studies on the Availability of Nutrients in Feedstuffs for Poultry • to determine the availability to poultry of energy and other essential nutrients in feedstuffs produced in Alberta	Alan Shires	University of Alberta	52,500	30,000
Effect of Dietary Fat on Skeletal Development in Broiler Chickens • to study the interrelationship between diet fat utilization and skeletal integrity in reducing leg-bone abnormalities in broilers	Steven Leeson	University of Guelph — Guelph	20,000	completed
Implications of *Salmonella* Contamination of Poultry Meat for Poultry Producers • to study the hazard posed by *Salmonella* in poultry and to evaluate production and processing controls to reduce its presence in poultry meat	M.E. Stiles	University of Alberta	30,000	32,000
Effect of Feedlot Management on Behaviour, Organ Development, Lean Tissue Growth Rate and Lean Tissue Conversion of Pigs • to evaluate the design of testing facilities and of feedlot management techniques employed in performance testing of swine	H.T. Fredeen	Agriculture Canada — Lacombe	38,000	40,000

The Effect of Creep Feeds and Creep Feed Composition on the Economics of Rabbit Production • to determine the effect of creep feeding on the growth of young rabbits and their survival to market weight	J.R. Hunt	Agriculture Canada — Agassiz	10,400	12,000
Purification and Characterization of Hemorrhagic Enteritis (HE) Virus in Turkeys • to study the HE virus in turkeys at the molecular level	Jan van den Hurk	Veterinary Infectious Disease Organization — Saskatoon	30,000	30,800
Diagnosis, Prevention and Control of *Haemophilus pleuropneumoniae* (*Hp.*) in Swine • to improve procedures for diagnosing *Hp.* in swine, to develop vaccines against the disease and to investigate the use of antibiotics to combat acute *Hp.* outbreaks	P.J. Willson	Veterinary Infectious Disease Organization and the Western College of Veterinary Medicine — Saskatoon	50,000	51,000
Potential for Improving the Productivity of Breeding Gilts • to investigate the biological potential and problems of breeding gilts soon after the onset of puberty	Robert Blair	University of Saskatchewan — Saskatoon	40,000	34,000
Evaluation of the Nutritive Value of Commonly Used Feedstuffs for Horses in Western Canada and the Effect of Cold on Nutrient Utilization • to test various horse feeds and forages for nutrient value and to see how cold affects their utilization	W.C. Sauer	University of Alberta		35,000
Effects of Level of Feeding on Sow Lactation Performance and Postweaning Reproductive Performance • to determine how the level of feed intake of lactating sows affects sow weight loss and subsequent reproductive performance and how the feeding level after weaning affects reproductive efficiency of sows and gilts	F.X. Aherne	University of Alberta		35,000
A Study of Heat and Moisture Loads and Air Quality in Commercial Poultry Rearing and Breeding Facilities • to determine heat and moisture loads and assess the effects of management procedures on air quality in commercial poultry housing	J.B. McQuitty	University of Alberta		45,000
Effects of Calcium and Phosphorus Levels in the Diet on the Incidence of Leg Weakness in Swine • to vary the levels of calcium and phosphorus fed to swine to determine if this affects leg joint soundness	F.X. Aherne	University of Alberta		25,000
A Search for Factors Associated with Acute Death Syndrome and Twisted Leg in Broiler Chickens in Western Canada • to study different flocks to see whether these two syndromes are associated with the type of chicken and/or various management practices and to make recommendations to reduce the severity and impact of both syndromes	Craig Riddell	Western College of Veterinary Medicine — Saskatoon		28,700
Nutritional, Pharmacological and Environmental Effects on Gonadotrophic Hormone Release and Puberty in Gilts • to determine whether early puberty can be encouraged in gilts by varying their intake of certain amino acids	R.J. Christopherson	University of Alberta		25,000
Development of an ELISA for the Serodiagnosis of Porcine Mycoplasmal Pneumonia • to develop an effective laboratory method of determining whether a serum sample contains the agent causing porcine mycoplasmal pneumonia	G.W. Stemke	University of Alberta		30,000

Amino Acid Nutrition in Swine • to determine the available protein levels in swine diets and to maximize the use of synthetic proteins in swine diets	W.C. Sauer	University of Alberta		52,000
Processing, Transportation, Marketing and Socio-Economics				
Rapeseed (Canola) Oil: Consumer Aspects of Refined Products • to assess the effect of food additives on the flavour of canola margarine and to determine the vitamin E content of canola products before and after being extensively used for frying	F.M. Vaisey-Genser	University of Manitoba — Winnipeg	84,560	in progress
Farm Management Field Laboratory • to study the factors involved in maintaining a communications link between university personnel and farm operators	Leonard Bauer	University of Alberta	132,250	50,000
Utilization of Low Erucic Acid Type Rapeseed (Canola) Oil as a Dietary Fat • to assess the metabolic changes in laboratory animals related to having canola oil in regular rations	M.T. Clandinin	University of Toronto — Toronto	112,000	52,700
Improvement of Shelf Life of Bakery Products with Gas Packaging Technique and Preservatives • to apply a gas packaging technique and preservative formula to extend the shelf life of bakery goods	Buncha Ooraikul	University of Alberta	72,000	completed
Compositional Analysis of Alberta Honeys • to examine and identify the composition of Alberta honeys in relation to their nectar source	Peter Sporns	University of Alberta	17,800	11,400
Interesterification of Canola Oils • to study margarines produced from two canola varieties as a base for altering the level of fatty acids in tablespreads	N.A.M. Eskin	University of Manitoba — Winnipeg	11,350	completed
A Study of an Improved Canola Extraction Process • to determine the benefits of disc-mill cracking of canola seed prior to normal processing	J.A. Blake	POS Pilot Plant Corporation — Saskatoon	35,000	in progress
Utilization of Egg Lipid in Infant Formulas • to establish the use of egg yolk fat in human diets by demonstrating its application in infant nutrition as a source of fat in formulas	M.T. Clandinin	University of Toronto — Toronto	30,000	31,200
A Study of Basis Behavior in the Western Canadian Canola Market • to study the factors contributing to unstable basis patterns (futures minus street price) in the canola market and to assess how they affect production and marketing of canola	C.A. Carter	University of Manitoba — Winnipeg		10,500
Evaluating Debt Contracts for Alberta Farmers • to compare long-term loans of various types with respect to the ability of farmers to repay them when net cash flow is variable and farm values fluctuate	R.G. Aukes	University of Manitoba — Winnipeg		19,000
Engineering Development and Economic Analysis of the Dehydrocooling Process • to develop and assess a method for freezing and drying fresh fruits and vegetables in terms of engineering requirements, energy needs and costs, and product characteristics	Marc LeMaguer	University of Alberta		34,000

Analysis of Terramycin (Oxytetracycline) in Honey • to develop new lab procedures for detecting and measuring low levels of terramycin in honey	Peter Sporns Lawrence Roth	University of Alberta and Alberta Agriculture — Edmonton		31,200
Pricing Efficiency of the Rapeseed Futures Market • to review futures and spot prices for rapeseed over the past 10 years to see if a situation exists which affects street prices and thus the return to producers	M.M. Veeman	University of Alberta		17,000
Productivity Growth in Western Canadian Agriculture: Empirical Measurement, Underlying Causal Influences and Policy Implications • to assess how much agricultural productivity increased from 1961 to 1980, what factors influenced this increase and what policies might encourage future increases	T.S. Veeman	University of Alberta		21,950
Effects of Changes to Statutory Freight Rates on the Structure of Cereal Agriculture in Alberta • to determine how changes to freight rates will affect cereal producers with respect to concentration of farm ownership, capital and labor demands, and the impact of these on rural communities	L.P. Apedaile	University of Alberta		26,800
An Assessment of Current On-Farm Computerized Record Keeping and the Potential for Expansion • to determine the number of farmers using computers for their farm accounts and how well existing systems meet the overall needs of farmers	J.H. Copeland Leonard Bauer	University of Alberta		19,250
Ruminants				
Evaluation of Rapeseed (Canola) Meal in Protected Fat as a Supplement for Lactating Dairy Cattle • to determine the effects of replacing soybean meal with canola meal in the diet of lactating dairy cows	J.J. Kennelly	University of Alberta	21,700	completed
Cattle Adaptability • to assess cattle adaptability to Alberta's climate and its effects on the maternal and productive traits of cattle	R.J. Christopherson	University of Alberta	75,000	completed
Evaluation and Improvement of the Nutritive Value of Alberta Forages • to determine the digestibility and nutritional usefulness to cattle of forages that can be grown, processed and preserved in northern Alberta	L.P. Milligan G.W. Mathison	University of Alberta and Alberta Agriculture — Edmonton	353,000	completed
Effect of Stress on Animal Production • to determine the responses of different types of cattle to the stresses of cold winter weather	R.J. Christopherson	University of Alberta	120,000	completed
Beef Cattle Breeding for Productive Efficiency • to develop breeding and selection strategies which can be used by producers to maximize profitability in beef breeding operations	R.T. Berg	University of Alberta	204,600	67,500
Quality Evaluation of Beef • to evaluate the eating quality, processing characteristics and storability of various types of beef	Z.J. Hawrysh	University of Alberta	109,360	34,500
Beef Cattle Growth and Carcass Research • to study the efficiency of cattle in converting feedstuffs to bone, muscle and fat	M.A. Price	University of Alberta	192,300	54,000

Intensification of Production by Management of Reproduction in Sheep: Basic and Applied Studies of Seasonal Constraints to Reproduction in the Ewe • to improve sheep production by investigating the biological and environmental mechanisms which reduce spontaneous breeding activity in sheep between February and July	N.C. Rawlings	Western College of Veterinary Medicine — Saskatoon	73,700	24,500
Infectious Bovine Rhinotracheitis (IBR) — *Pasteurella haemolytica* Induced Respiratory Disease • to study the interactions between viruses and bacteria in bovine respiratory disease and to produce better vaccines for both the viral and bacterial components of IBR	L.A. Babiuk	Western College of Veterinary Medicine — Saskatoon	195,750	61,500
Stable Toxin (ST) Vaccine • to produce a serum vaccine from Enterotoxin (ST) which is effective against scours caused by enterotoxigenic *Escherichia coli* (EEC)	C.H. Bigland	Veterinary Infectious Disease Organization — Saskatoon	16,300	completed
Rotavirus Vaccine Project • to improve available rotavirus vaccine with the aim of eventually developing a combination vaccine effective against the three most important causes of calf scours	S.D. Acres	Veterinary Infectious Disease Organization — Saskatoon	95,000	33,000
Reproductive Function of the Beef Bull: Studies of the Growing Bull Calf and Abnormal Adults to Investigate the Control of Sperm Production, Fertility and Reproductive Performance • to investigate the development of steroid production in beef bulls and its role in controlling sperm and hormone production	N.C. Rawlings	Western College of Veterinary Medicine — Saskatoon	68,640	24,000
Gonadotrophin Receptors in Preovulatory Follicles and Luteal Tissue at First Ovulation in Beef Cows • to determine the first ovulation in beef cows by measuring the concentrations of receptors for the hormones LH and FSH in target tissues	J.G. Manns	Western College of Veterinary Medicine — Saskatoon	91,450	48,000
Extra Low Voltage (ELV) Electrical Stimulation of Beef Carcasses Using a Rectal Electrode System • to study the changes in ELV-stimulated carcasses and to develop ELV stimulation for use in smaller abattoirs	F.H. Wolfe	University of Alberta	46,000	in progress
Evaluation of Dehydrated Alfalfa and Other Rumen Protein By-Pass Sources as Protein Supplements for Lactating Dairy Cattle • to evaluate the rumen degradability of protein in Alberta feedstuffs for use in formulating low cost rations for high producing dairy cows	J.J. Kennelly	University of Alberta	120,388	60,000
Maternal Recognition of Pregnancy in Cattle • to improve cow fertility and treat cow infertility by examining the changes caused by presence of an embryo	P.F. Flood	Western College of Veterinary Medicine — Saskatoon	66,000	in progress
Mineral Metabolism of Cattle • to determine the precise dietary requirements of cattle for copper, zinc and selenium under western Canadian conditions	M.E. Smart	University of Saskatchewan — Saskatoon	90,000	in progress
Toxicological Evaluation of Cereals Contaminated with Ergot • to assess the effects on livestock of ergot-contaminated cereals and the significance of residues in consumer meat products	H.B. Schiefer	Western College of Veterinary Medicine — Saskatoon	86,240	completed

Improvement of Feed Efficiency of Ruminants by Chemical Manipulation of Rumen Fermentation *In vivo* and *In vitro* • to assess the effects of the chemical monensin on feed utilization by sheep	Kuo-Joan Cheng	Agriculture Canada — Lethbridge	62,400	in progress
The Use of Surface Polysaccharide Antigens as a Vaccine in Preventing Diarrhea Caused by Enteropathogenic *E. coli* (EEC) in Calves, Pigs and Lambs • to use antibody-producing compounds from animals having EEC diarrhea to form a vaccine that prevents EEC scours in calves, pigs and lambs	S.D. Acres	Veterinary Infectious Disease Organization — Saskatoon and the University of Calgary — Calgary	115,000	23,000
Improvement of Feed Efficiency and Disease Resistance of Newborn Calves and Lambs by the Early Introduction of Beneficial Digestive Tract Bacteria • to develop a 'starter' formula for newborn ruminants using bacteria that aid digestion and prevent various digestive problems	Kuo-Joan Cheng J.W. Costerton	Agriculture Canada — Lethbridge and the University of Calgary — Calgary	53,000	31,000
Immunological Control of Shipping Fever • to develop methods for immunizing cattle against shipping fever and to evaluate current methods for handling the disease	P.H.G. Stockdale	Western College of Veterinary Medicine — Saskatoon	60,000	in progress
The Study of (Bovine) Viral Diarrhea-Mucosal Disease (BVD-MD) and Malignant Catarrhal Fever (MCF) Viruses in Order to Develop More Efficient Diagnostic Tests to Detect Infections in Domestic and Wild Animals • to develop rapid and reliable diagnostic tests to be used in determining the incidence and distribution of BVD-MD and MCF	Tatsuzo Yamamoto	University of Alberta	61,000	32,000
Determination of Efficacy of Methods Used to Fertility Test Beef Bulls for Multiple-Sire Breeding under Range Conditions • to evaluate, refine and develop selection criteria for predicting fertility in bulls breeding under range conditions	G.H. Coulter	Western College of Veterinary Medicine — Saskatoon and Agriculture Canada — Lethbridge	92,200	55,600
Further Evaluation of Trace Mineral Status in Alberta Feedstuffs in Relation to Animal Nutrition • to determine the level of copper and other trace minerals in Alberta feedstuffs and to study minerals affecting copper utilization by livestock	P.J. Martin	Norwest Feed Research Ltd. — Edmonton	25,000	completed
High Moisture Barley for Feedlot Cattle • to assess the relative values of combinations of dry and high moisture barley on the performance of feedlot cattle	J.J. Kennelly	University of Alberta	105,000	in progress
Virulence Mechanisms of *Haemophilus somnus* Bacteria Relative to the Carrier Status and the Immune Response of Infected Feedlot Cattle • to study how cattle develop resistance to *H. somnus* bacteria and how the source affects bacterial strength	J.R. Saunders	Western College of Veterinary Medicine — Saskatoon	36,000	24,000
Bovine Respiratory Disease in Alberta Feedlots • to identify and study the risk factors which affect the incidence and severity of respiratory disease in Alberta feedlot cattle	T.L. Church	Alberta Agriculture — Edmonton, and the Veterinary Infectious Disease Organization — Saskatoon	169,000	110,000
Production of Pregnancies Following the Storage of Bovine Embryos in Liquid Nitrogen • to examine the effect of factors such as age, rate of freezing and pH on successful cattle embryo freezing and reimplantation	B.F. Shea	Alberta Livestock Transplants Ltd. — Calgary	35,000	completed

Effects of Cold Environments on Digestion and Feed Intake of Ruminants • to identify forages and diet formulations which are most likely to be used by cattle and sheep exposed to cold environments	R.J. Christopherson	University of Alberta	40,000	44,000
Factors Influencing Natural Service Fertility of Beef Bulls in Pasture • to study the interrelationships of scrotal circumference, semen production and libido score in the natural fertility of bulls and the effects of preconditioning and feed energy on the libido and semen production of young bulls	Mahmoud Makarechian	University of Alberta	22,000	25,000
Agricultural Potential of Wild Ruminants • to determine the management requirements and the economic potential of using wild ruminants in domestic production systems	R.J. Hudson	University of Alberta	36,000	34,664
Ruminant Feed Evaluation Unit • to evaluate Alberta forages for their nutrient digestibility and voluntary intake by cattle and sheep	L.P. Milligan	University of Alberta and Alberta Agriculture — Edmonton	120,000	70,000
Chemical and Physical Determinants of Forage Digestion and Intake • to find a practical alternative to animal trials in assessing the nutritive value of Alberta forages	L.P. Milligan	University of Alberta and Alberta Agriculture — Edmonton	70,000	80,000
Quality of Barley for Feedlot Cattle • to determine the effects of barley quality on the performance of feedlot cattle and how poor quality barley is influenced by processing methods	G.M. Mathison	University of Alberta	25,000	in progress
The Effect of Delayed Breeding of Dairy Cows on Milk Yield, Reproductive Efficiency and Economic Returns to Dairy Producers • to examine various factors, including the effect of early versus late breeding, that reduce milk and calf production in dairy cows	J.J. Kennelly	University of Alberta, the University of British Columbia — Vancouver, and Agriculture Canada — Agassiz	90,000	60,000
Control of Protein Deposition in Ruminant Muscle • to characterize and quantify fundamental processes of beef muscle growth	J.R. Thompson	University of Alberta	20,000	53,000
Evaluation of the Efficiency of Weaned Calf Production in Beef Cattle • to assess breeding beef calves for increased yearling weight in order to improve the efficiency of weaned calf production	J.A. Newman	Agriculture Canada — Lacombe	20,000	27,000
The Effect of Ration, Implant and Rumensin on the Performance of Growing and Finishing Beef Steers • to study the interaction between monensin and growth implants in beef cattle and the effect that type of feed, such as grain or hay, has on their performance	S.E. Beacom	Agriculture Canada — Melfort	20,000	20,000
Field Testing the University of Alberta Beef Synthetic Bulls • to test Beef Synthetic bulls as a sire breed and to evaluate crossbred females as a maternal breed for commercial beef production	Mahmoud Makarechian	University of Alberta	40,000	32,000
Development and Testing of a Calf Scours Coronavirus Vaccine • to develop a vaccine against coronavirus diarrhea in calves and to combine it with *E. coli* and rotavirus vaccines to produce a single vaccine for preventing calf scours	S.D. Acres	Veterinary Infectious Disease Organization — Saskatoon	45,000	46,500

Management Strategies for Young Bulls • to study confinement techniques for raising young bulls	M.A. Price	University of Alberta	37,400	in progress
Morphological and Biochemical Studies of the Microbial Digestion of Treated and Supplemented Straw to Improve Its Nutrient Yield for Ruminants • to undertake studies on the bacterial population of the rumen with a view to increasing the capacity of ruminants to digest natural and treated straw	J.W. Costerton Kuo-Joan Cheng	University of Calgary — Calgary and Agriculture Canada — Lethbridge		27,000
Preparation of *Pasteurella haemolytica* Antigens for Use as a Vaccine against Shipping Fever • to test extracts of the organism causing shipping fever and to develop a vaccine for use in preventing this disease	T.J.G. Raybould	Veterinary Infectious Disease Organization — Saskatoon		60,000
Winter Stress Components in the Alberta Cattle Industry • to measure the effect on cattle of eating frozen high moisture feeds, and to study the response of cattle to cold stress in order to improve shelter and transportation methods	B.A. Young	University of Alberta		40,000
High Moisture Barley for Dairy Cows • to compare dry barley with high moisture barley in dairy cow diets and to provide an economic assessment of each	J.J. Kennelly	University of Alberta		50,000
Mechanism Mediating Ruminal Stasis in Lactic Acidosis (Grain Overload) • to determine what factors are involved in stopping movement of feedstuffs through the rumen in order to develop an effective treatment for this disorder	E.C. Crichlow	University of Saskatchewan — Saskatoon		21,000
Evaluation of Crystalline Copper Carbonate as a Dietary Copper Supplement for Ruminants • to test malachite, a naturally occurring mineral, as a source of copper supplement for ruminants	W.T. Buckley	Agriculture Canada — Agassiz		9,000
Splitting of Bovine Embryos to Produce Identical Twin Calves • to split calf embryos and to compare different methods of culturing them	B.F. Shea	Alberta Livestock Transplants Ltd. — Calgary		35,000
Nutrient Manipulation to Modify Brain Function, Appetite and Feed Efficiency in Farm Animals • to assess the effects of nutrient intake on appetite, energy expenditure and cold tolerance of pigs and some ruminants	R.J. Christopherson	University of Alberta		29,000

Special Crops

Regional Potato Testing • to breed superior potato lines suited to the processing needs and fresh and export marketing needs of Alberta	D.R. Lynch	Agriculture Canada — Lethbridge and the University of Alberta	200,376	76,144
Alternate Crop Varietal Development for High Oil and Protein Yields • to breed soybean and safflower varieties suitable for irrigated and dryland farming in Alberta	H.H. Mundel	Agriculture Canada — Lethbridge	172,880	44,000

Studies of the Development, Spread and Control of Four Economically Important Diseases of Greenhouse Crops • to study the factors aiding the development and spread of major greenhouse crop diseases and to develop integrated disease control methods	R.J. Howard	Alberta Agriculture, Alberta Horticultural Research Center — Brooks	123,800	completed
Effect of Various Soil-Active Herbicides on Succeeding Rotational Crops • to determine the duration of herbicidal residues and their effects on rotation crops	Rudy Esau	Alberta Agriculture, Alberta Horticultural Research Center — Brooks	21,600	completed
Establishment of Leaf Tissue Analysis Standards for Greenhouse Crops in Alberta • to establish procedures for detecting nutrient deficiencies and diseases in Alberta greenhouse crops	M.J. Rowell	Norwest Soil Research Ltd. — Edmonton	71,600	completed
The Impact of Cultural Practices on the Growth and Production of Tree Crops • to develop methods for maximizing the growth of woody plants without loss of winter hardiness	R.H. Knowles	University of Alberta	46,700	3,945
Studies on the Biology and Control of Root Diseases on Pulse Crops • to monitor the incidence of and develop controls for root diseases of pulse crops in southern Alberta	R.J. Howard	Alberta Agriculture, Alberta Horticultural Research Center — Brooks	58,000	completed
A Study of the Variability in Hill-to-Hill Yields of Alberta Potatoes • to identify and determine the relative importance of factors leading to variable yields in Alberta potatoes	W.T. Andrew	University of Alberta	58,300	24,200
The Maximum Possible Yields of Selected Vegetables under Controlled Environmental Conditions • to investigate the yield response of selected vegetables such as tomatoes to a totally controlled growing environment	E.W. Toop	University of Alberta	20,000	23,980
Pathogen-Free Seed Potatoes — To Ensure a Continuing Source of the Highest Quality of Seed Potatoes for Alberta Producers of Seed, Processing and Fresh Potatoes • to improve disease testing and control methods for seed potatoes	S.H. De Boer	Agriculture Canada — Vancouver	37,500	38,500
Control of Root Rot on Pulse Crops in Southern Alberta • to study factors such as soil temperature, moisture, compaction and ripping on the survival and incidence of root rot on pulse crops	R.J. Howard	Alberta Agriculture, Alberta Horticultural Research Center — Brooks	70,000	72,000
Cultivar and Agronomic Studies of Special Crops in Alberta with Emphasis on the Central and Northern Areas • to identify special crops and their varieties best suited to different areas of Alberta and to define areas suited to special crop production	R.G. Gaudiel	Alberta Agriculture, Alberta Horticultural Research Center — Brooks	75,000	in progress
A Study of Southern Alberta Russet Burbank Potato Fields to Establish the Optimum Ratios between Essential Elements to Promote Maximum Quality Growth • to calculate the optimum ratios of essential plant nutrients that will promote quality potato growth and yield	P.D. Sandberg	Alberta Soil and Feed Analysis Ltd. — Lethbridge	5,000	completed
Rapid Propagation of Saskatoon Plants *In vitro* • to develop a reliable, rapid method of propagating saskatoons vegetatively	R.E. Harris	Applied Research and Development Consultant — Victoria		25,700

Evaluation and Development of Practical Diagnostic Procedures for Potato Spindle Tuber Viroid Disease in Alberta • to develop a laboratory test for identifying the organism causing potato spindle tuber disease	Chuji Hiruki	University of Alberta	30,000
Frost Protection through Management of Ice Nucleating Bacteria • to undertake field tests of crops grown from seed inoculated with ice nucleating bacteria or non-ice nucleating bacteria and to evaluate the response of such crops to the first fall frosts	C.W. Gietz Toshi Kaneda	Alberta Agriculture — Edmonton and Alberta Research Council	20,400
Bacterial Siderophores as Plant Growth Stimulating Factors: Mobilization of Metals and Competition with Phytopathogenic Bacteria • to determine whether adding a non-disease producing strain of soil bacteria to the soil is beneficial to plant culture, especially for greenhouse crops	W.J. Page	University of Alberta	18,000
Field Production of Ornamental Plants (Dried) for the Floriculture Industry • to select and test cultivars of plants for possible use as dried ornamentals by western Canadian florists	B.J. Godwin	Olds College — Olds	20,000

Region One (Southern)

Zero Tillage vs. Minimum Till Trial • to provide a farm-scale comparison of a zero till and minimum till trial using conventional farm equipment	G.B.J. Knott	Stavely	2,450
Wheat and Barley Varietal Trials • to perform a three-year trial on five spring wheat and durum varieties and six barley varieties on stubble land	Ron Smith	Nanton	200
Wheat and Barley Varietal Trials on Summerfallow • to conduct a varietal trial on five spring wheat and durum and six barley varieties on fallow land	Marvin Vandervalk	Claresholm	own expense
Evaluation of the Warm Treatment of Swine Manure • to evaluate the reliability and operational ease of a combined solid-liquids separator/warm treatment process under Alberta conditions	Al Coutts	Bow Island	8,700
Blackbird Control • to attempt to control blackbirds through the use of bird scaring devices	Tom Droog	Bow Island	2,045
Savory Grazing Method • to determine the effectiveness of the Savory Grazing Method under commercial ranch conditions in Alberta	Blake and Mary Holtman	Taber/ Fort Macleod	7,523
Proper Inoculation of Pulse Crops • to adapt innovative inoculation procedures to farm-scale operations	Pulse Growers Association of Alberta	Lethbridge area	12,750
		Total	**$33,668**

Region Two (South Central)

Effect of Trace Mineral Supplementation on Calf Gains and Cow Breeding Performance • to establish if there is a need to feed trace minerals to cows on native pastures	Dave Lathwell	Sundre	1,350
Effect of Trace Mineral Supplementation on Calf Gains and Cow Breeding Performance • to establish if there is a need to feed trace minerals to cows on native pastures	J.C. Hughes	Longview	1,350
Preimmunization of Feeder Cattle • to demonstrate the value of preimmunizing calves before selling them	D.J. Edge	Airdrie	550
(A) Comparison of Weight Gains of Suckling Calves Implanted and Not Implanted with Ralgro and (B) Comparison of Weight Gains and Health Status of Weaned Calves in a Feedlot, Implanted Once and Twice with Growth Implants • to assess the value of using growth implants on suckling and weaned calves	John Negropontes	Sundre	1,000
Special Crops Demonstration Trial • to evaluate the potential for growing several species of special crops in the demonstration areas	Chinook Applied Research Association	Hanna/ Coronation	6,950
Snow Entrapment • to measure the benefit of using double diverging deflectors on a swather for increasing snow entrapment and, consequently, soil moisture	Don Pryor	Three Hills	750
Fertilizer Rejuvenation of an Aged Perennial Forage Stand • to illustrate the use of fall and spring broadcast fertilizer to prolong the useful life of a brome-alfalfa stand	Russel Mayberry	Hanna	1,050
Foxtail Barley Control • to increase awareness of the effectiveness of various chemicals in controlling foxtail barley	Willard Koch	Three Hills	250
Organic Matter Building • to promote the use of sweet clover underseeding and plowdown to replace summerfallow	Frank Davidson	Morrin	350
Evaluation of Moisture Conservation by Various Stubble Heights • to evaluate the ability of stubble cut to various heights to trap greater amounts of snow	Chinook Applied Research Association	Oyen	745
Evaluation of Moisture Conservation of Continuous Cropping vs. Summerfallow Rotation • to assess the moisture levels and crop yields of continuous cropping and summerfallow systems	Chinook Applied Research Association	Youngstown	905
Nitrogen and Organic Matter Building • to promote the use of alfalfa underseeding as a replacement for summerfallow	Neil Cameron	Huxley	75
		Total	**$15,325**

Region 3 (North Central)

Pasture Improvement Demonstration • to demonstrate that good forage management, use of adapted species and rotational grazing can increase livestock production on what is often considered wasteland	Geoff and David Hoar	Innisfail	5,300

Ralgro Implant Trial with Bulls • to evaluate the effect of Ralgro implants on the growth, sexual development, feedlot management and carcass characteristics of bull calves	Ty Lund	Alhambra	525
Central Alberta High Moisture Barley Study • to collect time-series data on high moisture barley yields, quality, harvest dates and feeding results	Mel Stickland	Red Deer	5,500
Effect of Bovaid and Growth Implants in Yearling Steers and Nursing Bull Calves • to determine the effects of using implants and fly control on weight gains of yearlings and calves	Dave Carlyle	Blackfalds	8,102
Effect of Growth Implants on the Growth and Sexual Development of Bull, Steer and Heifer Calves • to determine the effects of Ralgro on bull calf growth, of early or late castration in combination with use of Ralgro on steer calves, and of implants on the growth and sexual development of heifers	Stan and Ron Marcinek	Condor	2,688
Effect of Trace Minerals on the Growth of Suckling Calves and the Response to Ralgro Implants in Bull Calves • to determine the effect of a combination of feeding trace minerals and using Ralgro on the growth of suckling beef calves and to evaluate the effect of Ralgro on the growth and sexual development of bull calves	Gordon Young	Leslieville	1,469
Swath Turner • to build prototype equipment for turning swath to increase the drying rate of forage	A.J. Murdock	Eckville	2,100
Free Stall Dairy Barn • to compare conventional stalls and stalls with brisket boards with regard to cleanliness, cow comfort, bedding required and cow preference	Case Korver	Rocky Mountain House	1,465
Soil Moisture Conservation Practice • to increase snow entrapment by creating stubble barriers	Lindsay Penosky	Botha	250
Liming and Ripping Acid Solonetzic Soil • to demonstrate the benefits of liming acid soils and of ripping solonetzic soils to increase the productivity of alfalfa and barley crops	G.D. Hughes	Wetaskiwin	2,387
Waterproof Bin Skirts • to design and construct a mold for use in producing fiberglass bin skirts for moisture proofing steel grain bin floors	Warren Henderson	Forestburg	700
Solonetzic Soil Improvement • to improve the productivity of solonetzic soil through deep tillage and lime applications	Ralph Klassen	Stettler	7,000
		Total	**$37,486**

Region Four (Northeast)

Evaluation of Cultural Practices Used to Extend the Growing Season and Increase Production and Quality of Vegetables • to extend the growing season and to increase production and quality of fruits and vegetables through the use of innovative cultural techniques	Robert and Bernice Grey	Fort McMurray	5,250

Comparison of Smooth Wire Suspension Fencing with Standard Barbed Wire Fencing • to compare five-strand smooth wire suspension fencing to standard four-strand barbed wire fencing	D.S. Millar	St. Paul	
Zero (Minimal) Till Demonstration • to study the feasibility of zero (minimal) tillage in the Wainwright area	Keith Brower	Wainwright	6,632
Cultivated Blueberry Crop Trial • to assess what blueberry varieties and cultural practices are most productive in the Bonnyville area	Ed and Eleanor Reddecliff	Bonnyville	3,500
Application of Passive Solar Collectors to Slant Wall Farm Shops • to create an inexpensive method of controlling the temperature in a farm shop	Kirk Harrold	Lamont	2,760
Pasture Demonstration Project • to extend the grazing season and to increase beef production through use of recommended pasture species, fertilizer rates and rotational grazing fencing methods	Gary Mouille	Lac La Biche	5,335
		Total	**$26,677**
Region Five (Northwest) **Grain Feeding Yearlings on Pasture** • to evaluate limit feeding and grain feeding pasture yearlings and to assess problems associated with the physical layout of rotational grazing pastures	Keith English	Dapp	5,623
Late Summer Pasture and Grain versus Feedlot for Finishing Yearling Heifers • to determine a least-cost method of maximizing weight gain by comparing supplemental feeding in late summer with placing cattle directly into a feedlot	Murray Holt	Sangudo	2,880
Solar Heated Air for Grain Drying and Aeration and Building Space Heating • to enable early harvest through provision of cheap, efficient grain drying and to reduce energy costs by using a solar heating mechanism for space heating	Schwanke Farms Ltd.	Sangudo	5,000
Dairy Pasture Demonstration Project • to demonstrate a high production rotational grazing system for dairy cattle through the use of recommended legume and grass species, fertilizers, grazing and rest periods, and stocking rates	Ernie Siemens	Rochester	5,854
Two Four-Wheel Drive Tractors Hooked in Tandem, Using One Operator • to create a method for one person to hook two tractors in tandem for the purpose of pulling extra-long farm implements	Jerry Bauer	Thorhild	2,950
Chaff Evaluation, Athabasca District • to evaluate chaff quality from various cereal crops and to assess cow performance when fed chaff as part of a balanced feed ration	Dave Bencharsky	Boyle	5,450
		Total	**$27,757**
Region Six (Peace River) **Raised Lambing Crates** • to demonstrate health and other benefits of confining pregnant ewes to raised crates for two or more days before delivery	L.T. Jones	Fairview	3,822

Zero Till Drill • to investigate the economics and productivity arising from use of a zero till drill in the Peace River area	Mike Gach	Nampa	11,000
Automatic Depth Control for Farm Implements • to develop a depth control for use on a wing-type cultivator	Dan Ropchan	Grimshaw	1,950
Hog Barn Heat Exchanger • to construct and test a prototype of a simple, functional heat exchanger	Steve Pain	Nampa	2,770
Wood Heated Hot-Water-to-Hot-Air Heating System • to evaluate a wood heating system designed to heat a farm residence and shop	Brian Leitch	Grimshaw	5,500
		Total	**$25,042**

University of Alberta

Design and Control of Air Inlets for Ventilation of Animal Housing • to design a simple and inexpensive ventilation system that will function consistently in Alberta weather conditions for use in new and existing buildings	J.J. Leonard	Agricultural Engineering	9,300
Comparison of Evaluation Techniques Used in Meat Research • to compare the reliability, precision and accuracy of sensory evaluation techniques used in meat research	P.J. Shand	Foods and Nutrition	1,900
Effect of Live Weight and Fat Loss on Sow Performance and Productivity • to determine the effects of level of feeding on sow weight loss and fat mobilization during lactation; to assess effects of weight loss and fat mobilization on sow health and reproductive performance	E.M. Weltzien	Animal Science	6,000
Effect of Diet and Cooking Method on the Quality Attributes and Chemical Composition of Beef from Bulls • to evaluate the effects of diet and cooking method on the quality attributes and chemical composition of beef from bulls	M.E. McKinley	Foods and Nutrition	3,000
Energy Expenditure on Ion Transport in Intestinal Epithelium and Liver in Sheep and Cattle • to determine energy expenditures of sheep and cattle associated with the transport of sodium and potassium ions in the intestinal epithelium and liver	B.W. McBride	Animal Science	10,000
Fat Mobilization in Dairy Cows in Early Lactation • to increase the pool of information on factors which influence weight loss in dairy cows in early lactation	E.M. Sexton	Animal Science	10,000
Bioenergetics of Wapiti • to examine factors influencing the growth and energy requirements of wapiti; to develop strategies for efficient feed allocation to domesticated wapiti	W.G. Watkins	Animal Science	8,400

TITLE AND OBJECTIVE	STUDENT	DEPARTMENT	FUNDING 1982/83
Margin Analysis and Trends in Consumer Demand for Red Meats and Poultry • to document the margins between farm gate, wholesale and retail outlet for beef, pork, poultry and lamb; to construct models regarding the role margins play in pricing; to determine trends in consumer demand	J.R. MacArthur	Rural Economy	5,500
Cytological and Biochemical Characterization of the Potential B Genome Donors of Common Wheat, *Triticum aestivum* • to determine the source of the B genome donor of *Triticum aestivum*	K.B. Kerby	Genetics	5,000
Implications to Alberta of Remaining Independent or Participating in the National Chicken Marketing Plan • to provide information to aid Alberta broiler growers in making their decision to remain independent or to join the Canadian Chicken Marketing Agency	Meghann Douglas	Rural Economy	3,550
Patterns of Fat Deposition in Mice Selected for High Six Week Body Weight • to investigate and describe the pattern of fat deposition in lines of mice that are genetically distinct in growth rate and feed efficiency; to investigate mechanisms controlling fat deposition	R.K. Salmon	Animal Science	6,000
Development of Chemical Methods for Predicting Protein Quality (Degradability) in Dairy Cow Rations • to improve methods for evaluating protein in dairy cow rations, emphasizing rapid and reliable chemical methods	B.K. Kirkpatrick	Animal Science	10,000
Study of Pretest and On-Test Performance of R.O.P. Tested Boars • to determine relationships and correlations between pretest and on-test performance as well as the effects of pretest environment on test performance	B.B. Allan	Animal Science	5,000
Cross-Fostering as a Measure of Direct and Indirect Genetic Effects • to compare correlated response in lines of mice that are genetically distinct in growth rate, feed efficiency and rate of protein and fat deposition; to use cross-fostering to measure genetic variation	D.R.C. Bailey	Animal Science	6,000
Effects of Boar Exposure on Puberty Induction of the Young Gilt • to evaluate management procedures that influence the age of gilts at puberty	F.D. Evans	Animal Science	7,900
Western College of Veterinary Medicine			
Pathogenesis of Nervous Signs Associated with Bovine Enteric Coccidiosis • to determine the pathogenesis associated with "nervous" coccidiosis and to describe the characteristics of this disease	C.M. Isler	Veterinary Pathology	9,900
Isolation and Characterization of IBRV-Specific Glycoproteins and Their Relationship to Immune Recognition • to identify the glycoproteins of infectious bovine rhinotracheitis (IBR) virus and to determine which are involved in inducing immunity against the virus in order to eventually produce a vaccine	Sylvia van den Hurk -van Drunen Littel	Veterinary Microbiology	9,900
		Total	**$117,350**

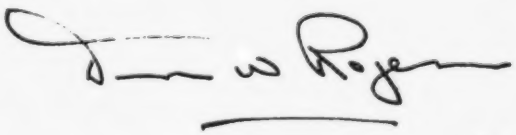
AUDITOR'S REPORT

AGRICULTURAL RESEARCH COUNCIL OF ALBERTA
FARMING FOR THE FUTURE PROGRAM

To the Members of the Agricultural
Research Council of Alberta

I have examined the balance sheet of the Agricultural Research Council of Alberta Farming for the Future Program as at March 31, 1983 and the statement of revenue, expenditure and unexpended funds for the year then ended. My examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as I considered necessary in the circumstances.

In my opinion, these financial statements present fairly the financial position of the Program as at March 31, 1983 and the results of its operations for the year then ended in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year.



C.A.
Auditor General

Edmonton, Alberta
September 9, 1983

AGRICULTURAL RESEARCH COUNCIL OF ALBERTA
FARMING FOR THE FUTURE PROGRAM

BALANCE SHEET
As at March 31, 1983

Statement A

	1983	1982
ASSETS		
Current:		
Deposits in Trust (Note 3)	$ 1,544,785	$ 40,855
	$ 1,544,785	$ 40,855
LIABILITIES		
Current:		
Research grants payable	$ 931,200	$ —
Management fees payable	35,316	—
Due to the Alberta Heritage Savings Trust Fund	2,420	—
Holdbacks payable	9,965	25,165
	978,901	25,165
Unexpended funds, Statement B	565,884	15,690
	$ 1,544,785	$ 40,855

The accompanying notes are part of these financial statements.

STATEMENT OF REVENUE, EXPENDITURE AND UNEXPENDED FUNDS
For the Year Ended March 31, 1983

Statement B

	1983	1982
Revenue		
Contributions from the Province of Alberta:		
Alberta Heritage Savings Trust Fund (Note 4)	$ 7,496,417	$ 3,499,253
Expenditure		
Research grants, Schedule 1:		
Universities	3,041,541	2,073,773
Other	192,699	161,540
Projects administered by the Alberta Research Council, Schedule 2	3,279,135	1,254,375
Research grants under the Graduate Student Research Support Program, Schedule 3	117,350	—
Research grants under the On-Farm Demonstration Program, Schedule 4	141,493	—
Management fees	174,005	—
	6,946,223	3,489,688
Excess of revenue over expenditure	550,194	9,565
Unexpended funds at beginning of year	15,690	6,125
Unexpended funds at end of year	$ 565,884	$ 15,690

NOTES TO THE FINANCIAL STATEMENTS
March 31, 1983

NOTE 1 AUTHORITY

The Farming for the Future Program operates under the authority of the Department of Agriculture Act, Chapter D-12, Revised Statutes of Alberta 1980.

Pursuant to section 6 of the Act, the Program was established by Ministerial Order under the administration of the Agricultural Research Council of Alberta.

NOTE 2 SIGNIFICANT ACCOUNTING POLICIES

General

Research grants are recorded in these financial statements when conditions of the grants have been formally accepted by the researchers. Unexpended balances of grant funds held in researchers' accounts are not reflected in these financial statements.

Changes in Financial Position

A statement of changes in financial position is not provided as disclosure in these financial statements is considered to be adequate.

Administration Expenses

Administration expenses are provided by the Province of Alberta at no cost to the Program, and accordingly are not reflected in these financial statements.

NOTE 3 DEPOSITS IN TRUST

Deposits in trust consist of $12,385 (1982 $25,355) deposited in the General Trust Account of the Province of Alberta and $1,532,400 (1982 $15,500) held in trust by the Alberta Research Council.

NOTE 4 CONTRIBUTIONS FROM THE PROVINCE OF ALBERTA

The Appropriation (Alberta Heritage Savings Trust Fund, Capital Projects Division) Act, 1981 provided for payments to the Program to a maximum of $7,500,000 for the year ended March 31, 1983 (1982 $3,500,000). This provision which enabled the Program to receive funds up to the stated maximum lapsed at March 31, 1983.

NOTE 5 CAPITAL ASSETS

Pursuant to agreements between the Council and two research agencies, The University of Alberta and the Alberta Research Council, capital assets purchased from research grants remain the property of the Province of Alberta. At March 31, 1983 the cost of such capital assets was approximately $1,151,000 (1982 $764,000).

NOTE 6 COMMITMENTS

As at March 31, 1983 the Program had commitments totalling approximately $5,769,000 with respect to unadvanced amounts on grants approved by the Council but where the conditions had not been formally accepted by researchers.

NOTE 7 COMPARATIVE FIGURES

The 1982 figures have been restated where necessary to conform to 1983 presentation.

NOTE 8 APPROVAL OF FINANCIAL STATEMENTS

These financial statements were approved by management on September 9, 1983.

AGRICULTURAL RESEARCH COUNCIL OF ALBERTA
FARMING FOR THE FUTURE PROGRAM

SCHEDULE OF RESEARCH GRANTS
For the Year Ended March 31, 1983

Schedule 1

	1983	1982
Universities:		
The University of Alberta	$2,100,491	$1,428,793
The University of Saskatchewan	729,450	470,130
The University of Toronto	74,000	35,000
The University of Manitoba	68,300	67,850
Queen's University	47,000	50,000
The University of Guelph	20,000	—
The University of Calgary	2,300	2,500
The University of British Columbia	—	19,500
	3,041,541	2,073,773
Other:		
Western Cooperative Fertilizers Ltd.	57,850	25,000
Norwest Soil Research Ltd.	23,500	40,300
Vertec Industries Ltd.	35,000	—
P.O.S. Pilot Plant Corp.	31,500	—
Fairview College	17,400	—
C.W. Farmland Reclamation Ltd.	15,000	—
Alberta Soil and Feed Analysis Ltd.	5,000	—
Chinook Applied Research Association	4,400	7,600
Pirker Apiaries	3,049	3,640
Norwest Feed Research Ltd.	—	50,000
Alberta Livestock Transplant Ltd.	—	35,000
	192,699	161,540
	$3,234,240	$2,235,313

SCHEDULE OF RESEARCH GRANTS FOR PROJECTS ADMINISTERED BY THE ALBERTA RESEARCH COUNCIL
For the Year Ended March 31, 1983

Schedule 2

	1983	1982
Canada Department of Agriculture:		
Beaverlodge	$ 997,885	$ 410,150
Lethbridge	512,900	139,840
Lacombe	274,200	124,200
Saskatoon	462,150	72,785
Melfort	71,000	35,700
Vancouver	37,500	—
Agassiz	10,400	—
Brandon	31,000	—
Alberta Department of Agriculture:		
Lethbridge	275,000	103,600
Lacombe	256,000	203,000
Brooks	151,000	143,100
Edmonton	39,000	—
Alberta Research Council	161,100	22,000
	$3,279,135	$1,254,375

SCHEDULE OF GRANTS FOR PROJECTS UNDER THE GRADUATE STUDENT RESEARCH SUPPORT PROGRAM

Schedule 3

For the Year Ended March 31, 1983

	1983	1982
The University of Alberta	$ 97,550	$ —
Western College of Veterinary Medicine	19,800	—
	$ 117,350	$ —

SCHEDULE OF GRANTS FOR PROJECTS UNDER THE ON-FARM DEMONSTRATION PROGRAM

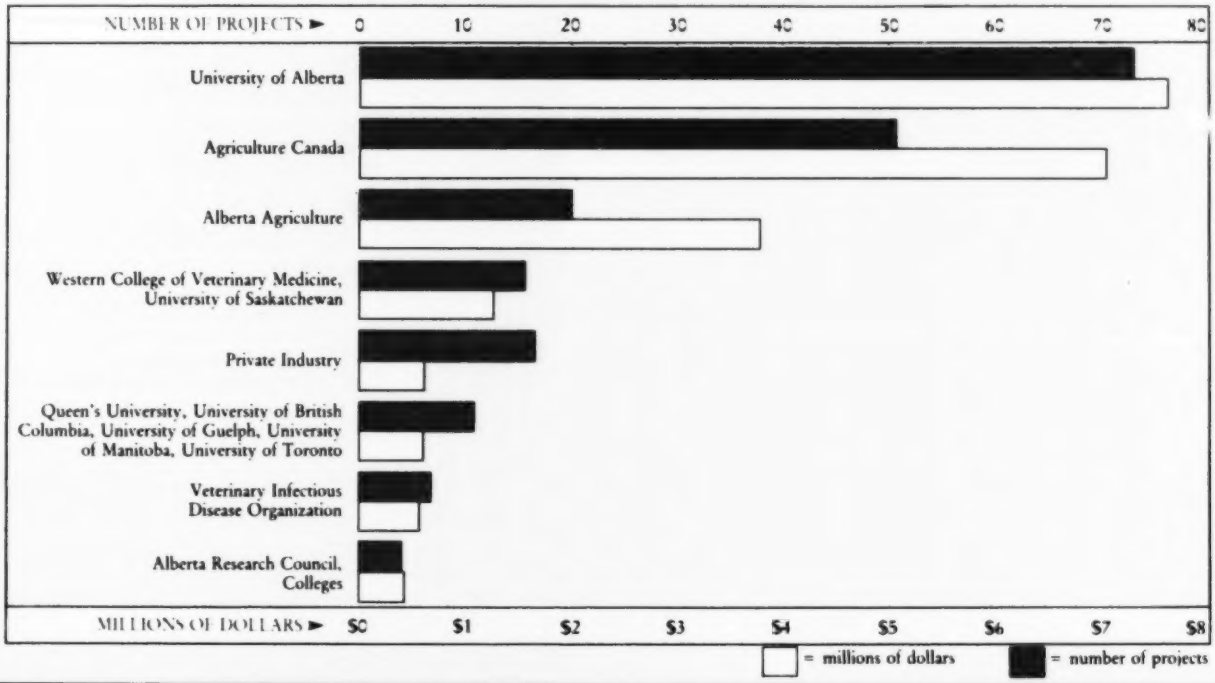
Schedule 4

For the Year Ended March 31, 1983

	1983	1982
Region:		
Red Deer	$ 36,986	$ —
Lethbridge	29,843	—
Barrhead	25,257	—
Fairview	19,932	—
Airdrie	15,325	—
Vermilion	14,150	—
	$ 141,493	$ —

Distribution of Research and Estimated Funding by Institution, 1979/80 - 1983/84

	Number of Projects			Funding Awarded			
Institution	1983/84	1979/80 to 1983/84	Joint Involvement* 1979/80 to 1983/84	1983/84	% of Total Awarded	1979/80 to 1983/84	% of Total Awarded
Agriculture Canada	42	51	5	2,695,617	38.2	7,006,208	31.7
Alberta Agriculture	12	20	5	897,315	12.7	3,786,995	17.1
Alberta Research Council	1	2	3	145,000	2.1	394,200	1.8
Colleges	2	2	—	33,100	0.5	50,500	0.2
Private Industry	6	17	1	198,500	2.8	666,800	3.0
Queen's University	1	1	—	41,000	0.6	138,000	0.6
University of Alberta	57	73	5	2,331,528	33.1	7,626,722	34.5
University of British Columbia	—	1	1	—	—	37,500	0.2
University of Calgary	—	—	4	—	—	—	—
University of Guelph	—	1	—	—	—	20,000	0.1
University of Manitoba	2	6	—	29,500	0.4	236,010	1.1
University of Toronto	2	2	—	83,900	1.2	225,900	1.0
Veterinary Infectious Disease Organization	6	7	1	244,300	3.5	595,600	2.7
Western College of Veterinary Medicine and the University of Saskatchewan	11	16	2	342,700	4.9	1,337,540	6.0
TOTAL	142	199	27	$7,042,460		$22,121,975	



Distribution of Research Projects and Estimated Funding by Program Area, 1979/80 - 1983/84

Program Area	Number of Projects 1983/84	% of Total Number	1979/80 to 1983/84	% of Total Number	Funding Awarded 1983/84	% of Total Awarded	1979/80 to 1983/84	% of Total Awarded
Apiculture/Entomology	8	5.6	13	6.5	$ 409,200	5.8	$ 1,597,025	7.2
Cereals and Oilseeds	21	14.8	28	14.1	1,951,519	27.7	5,333,600	24.1
Forages	21	14.8	32	16.1	935,993	13.3	3,729,623	16.9
Irrigation	6	4.2	7	3.5	190,735	2.7	460,735	2.1
Land Resources and Engineering	10	7.0	13	6.5	767,880	10.9	2,466,205	11.1
Non-Ruminants	18	12.7	22	11.1	619,500	8.8	1,487,010	6.7
Processing, Transportation, Marketing and Socio-Economics	12	8.5	16	8.0	325,000	4.6	819,960	3.7
Ruminants	34	23.9	50	25.1	1,445,764	20.5	4,870,192	22.0
Special Crops	12	8.5	18	9.1	396,869	5.7	1,357,625	6.2
TOTAL	142		199		$7,042,460		$22,121,975	

Distribution of New Research Projects and Estimated Funding by Institution, 1983/84

Institution	Number of Projects	% of Total Projects	Joint Involvement*	Funding Awarded	% of Total Awarded
Agriculture Canada	13	26.5	—	$1,218,075	49.9
Alberta Agriculture	2	4.1	—	30,900	1.3
Alberta Research Council	1	2.0	1	145,000	5.9
Colleges	1	2.0	—	20,000	0.8
Private Industry	5	10.2	—	191,600	7.9
University of Alberta	21	42.9	—	664,900	27.2
University of Calgary	—	—	1	—	—
University of Manitoba	2	4.1	—	29,500	1.2
Veterinary Infectious Disease Organization	1	2.0	—	60,000	2.5
Western College of Veterinary Medicine and the University of Saskatchewan	3	6.2	—	79,700	3.3
TOTAL	49		2	$2,439,675	

* Funds for a project are awarded to only one institution, although some projects are actually joint institutional efforts. When an institution is designated as having "joint involvement" in a project, it is participating in a project for which another institution has been awarded the funding.

Program Area	Apiculture/Entomology	Cereals and Oilseeds	Forages
Chairman	Mr. G.A. Hachey, *Falher* Producer	Mr. Mel Richards, *Olds* Producer	Mr. C.E. Anderson, *Barrhead* Producer
Vice-Chairman	Mr. J.B. Gurba, *Edmonton* Alberta Agriculture	Mr. R.W. Nelson, *Lacombe* Alberta Agriculture	Mr. A.E. Sherman, *Lacombe* Alberta Agriculture
Members	Mr. Keith Price, *Edmonton** Alberta Agriculture	Dr. R.M. Elofson, *Edmonton* Alberta Research Council	Dr. S.G. Bonin, *Beaverlodge* Agriculture Canada
	Dr. Jerry Awram, *Hines Creek* Producer	Dr. M.L. Kaufman, *Lacombe* Agriculture Canada	Dr. E.A. Clark, *Edmonton** University of Alberta
	Dr. R.H. Gooding, *Edmonton* University of Alberta	Dr. Z.P. Kondra, *Edmonton* University of Alberta	Dr. R.M. Elofson, *Edmonton* Alberta Research Council
	Mr. Stuart McDonald, *Lethbridge* Agriculture Canada	Mr. G.J. Jackson, *Calgary* Producer	Mr. E.J.C. Jarvis, *Opal* Producer
	Dr. S.H. Pawlowski, *St. Vincent* Producer	Mr. N.J. Olsen, *Olds* Producer	Mr. M.C. Longson, *Beaverlodge* Producer
			Dr. W.P. Skoropad, *Edmonton* University of Alberta

Program Area	Irrigation	Land Resources and Engineering	Non-Ruminants
Chairman	Mr. E. J. Shimbashi, *Barnwell* Producer	Mr. C.S. (Johnny) Vos, *Keg River* Producer	Mr. E.L. Fjordbotten, *Granum* M.L.A.
Vice-Chairman	Mr. R.F. Smith, *Lethbridge* Alberta Agriculture	Mr. A.W. Goettel, *Edmonton* Alberta Agriculture	Dr. R.G. Christian, *Edmonton* Alberta Agriculture
Members	Mr. L.E. Buckwell, *Fort Macleod* Producer	Dr. R.J. Fessenden, *Edmonton** Alberta Research Council	Mr. P.J. Mueller, *Lacombe* Producer
	Mr. P.D. Edlund, *Burdett* Producer	Mr. H.F. Greenfield, *Westlock* Producer	Dr. Craig Riddell, *Saskatoon* Western College of Veterinary Medicine
	Mr. L.R. Garner, *Hill Spring* Producer	Mr. J.D. Lindsay, *Edmonton* Alberta Research Council	Dr. A.R. Robblee, *Edmonton* University of Alberta
	Mr. Jim Hajash, *Brooks* Producer	Dr. D.C. MacKay, *Lethbridge* Agriculture Canada	Dr. E.E. Swierstra, *Lethbridge* Agriculture Canada
	Mr. R.W. McLeod, *Claresholm* Producer	Dr. W.B. McGill, *Edmonton* University of Alberta	Mr. L.A. Vasselin, *Three Hills* Producer
	Mr. J.C. Purnell, *Lethbridge* Alberta Agriculture		
	Mr. J.W. Thiessen, *Edmonton* Alberta Environment		

Program Area	Processing, Transportation, Marketing and Socio-Economics	Ruminants	Special Crops
Chairman	Mr. W.H. Van de Walle, *Legal* Producer	Mr. J.E. Butler, *Youngstown* Producer	Mr. V.C. (Lud) Prudek, *Bow Island* Producer
Vice-Chairman	Dr. W.W. Ballantyne, *Edmonton* Alberta Agriculture	Dr. H.B. Jeffery, *Edmonton* Alberta Agriculture	Dr. John Wiebe, *Edmonton* Alberta Agriculture
Members	Mr. J.M. Lockhart, *Edmonton* Agriculture Canada	Dr. R.T. Berg, *Edmonton* University of Alberta	Dr. W.T. Andrew, *Edmonton* University of Alberta
	Mr. D.A. Neil, *Edmonton* Alberta Economic Development	Dr. R.M. Elofson, *Edmonton* Alberta Research Council	Mr. Bernhard Baerg, *Vauxhall** Producer
	Mr. G.E. Phillipchuk, *Edmonton* Alberta Research Council	Dr. J.G. Manns, *Saskatoon** Western College of Veterinary Medicine	Dr. R.M. Elofson, *Edmonton* Alberta Research Council
	Dr. M.M. Veeman, *Edmonton* University of Alberta	Dr. R.J. Mapletoft, *Saskatoon* Western College of Veterinary Medicine	Mr. W.E. (Ed) Good, *Blackfalds* Central Alberta Florists Ltd.
		Dr. L.P. Milligan, *Edmonton** University of Alberta	Mr. E. J. Shimbashi, *Barnwell* Producer
		Dr. J.A. Newman, *Lacombe* Agriculture Canada	Dr. D.B. Wilson, *Lethbridge* Agriculture Canada
		Mr. T. G. Thurber, *Winfield* Producer	

Region	I. Southern	II. South Central	III. North Central
Chairman	Mr. C.S. Clark, *Lethbridge* Alberta Agriculture	Mr. Albert Reimer, *Airdrie* Alberta Agriculture	Mr. A.D. MacKenzie, *Red Deer* Alberta Agriculture
Members	*Producers*	*Producers*	*Producers*
	Mr. Brian Otto, *Warner*	Mr. Garnet Hammer, *Olds*	Mr. W.G. Ballhorn, *Wetaskiwin*
	Mr. Lynn Thacker, *Bow Island*	Mr. Ron Leonhardt, *Drumheller*	Mr. David Hueppelheuser, *Blackfalds*
	Mr. Marvin Vandervalk, *Claresholm*	Mr. Ben Lockhart, *Youngstown*	Mr. Ernest Lindholm, *New Norway*
		Mr. Glen Smith, *High River*	Mr. F. H. Mueller, *Lacombe*
			Ms. Marilyn Sharp, *Lacombe*
	Alberta Agriculture Staff	*Alberta Agriculture Staff*	*Alberta Agriculture Staff*
	Mr. T.O. Aspeslet, *Lethbridge*	Mr. A.E. Edwards, *Strathmore*	Mr. G. J. Bradshaw, *Red Deer*
	Ms. L.A. Brodersen, *Lethbridge*	Mr. D.N. Milligan, *Airdrie*	
	Mr. G.G. Bruins, *Lethbridge*	Mr. D.A. Roll, *Airdrie*	
	Mr. M.A. Clawson, *Lethbridge*	Mr. R.A. Smith, *Airdrie*	
	Mr. G.H. Dill, *Lethbridge*	Ms. L.E. Starling, *Airdrie*	
	Mr. E.A. George, *Lethbridge*	Mr. L.J. Welsh, *Airdrie*	
	Mr. A.M. Harvey, *Lethbridge*		
	Ms. C.A. Rex, *Taber*		
	Mr. B.R. Shaw, *Lethbridge*		
	Mr. A.S. Toly, *Claresholm*		
	Mr. John Van Keulen, *Medicine Hat*		
	Mr. W. J. Wankel, *Lethbridge*		

Region	IV. Northeast	V. Northwest	VI. Peace River
Chairman	Mr. R.F. Berkan, *Vermilion* Alberta Agriculture	Mr. J.B. Tackaberry, *Barrhead* Alberta Agriculture	Mr. E.H. Horton, *Fairview* Alberta Agriculture
Members	*Producers*	*Producers*	*Producers*
	Mr. Clifford Harbin, *Rivercourse*	Mr. Jerry Bauer, *Thorhild*	Mr. Larry Greer, *High Prairie*
	Mr. Bernard Kotelko, *Vegreville*	Mr. Donald Meunier, *Barrhead*	Mr. Gerald Rich, *High Prairie*
	Mr. Bryan Perkins, *Wainwright*	Mr. Keith Porter, *Duffield*	
	Mr. L.W. Tuck, *Lavoy*	Mr. Mike Yaworski, *Fort Saskatchewan*	
	Alberta Agriculture Staff	*Alberta Agriculture Staff*	*Alberta Agriculture Staff*
	Mr. Walter Dietz, *Vermilion*	Mr. R.K. Hand, *Barrhead*	Mr. Garry Coy, *Fairview*
	Mr. E.L. Treffry, *Vermilion*	Mr. Andrew Livingstone, *Barrhead*	Mr. F.H. de Mille, *Peace River*
	Mr. B.D.J. Wilson, *Wainwright*	Mr. K.J. Lopetinsky, *Barrhead*	Mr. M.S. Kuryvial, *Grande Prairie*
	Mr. H.L. Yoder, *Lac La Biche*	Mr. R.L. Winchell, *Barrhead*	Mr. G.R. Monner, *Fairview*
			Mr. Mike Rudakewich, *Fairview*
			Mr. Duane Wood, *Fairview*
			Mr. Dave Spencer, *Fairview*

* Some program committees had new members appointed late in 1982-83 as replacements for those who were stepping down. These new members are indicated with an asterisk.

Hon. E.L. Fjordbotten
Minister of Agriculture
Chairman
(Past Representative of the Alberta Legislature)

Mr. H.B. McEwen
Deputy Minister
Alberta Agriculture
Vice-Chairman

Mr. C.E. Anderson
Producer
Barrhead

Dr. J.P. Bowland
Dean, Faculty of Agriculture and Forestry
University of Alberta

Mr. J.E. Butler
Producer
Youngstown

Dr. G.G. Cloutier
President
Alberta Research Council

Dr. C.R. Elliot
MLA
(Past Representative of Agriculture Canada)

Mr. G.A. Hachey
Producer
Falher
(Past Producer Member)

Mr. N.A. Harris
Producer
Beaverlodge

Dr. A.O. Olson
Assistant Deputy Minister
Alberta Agriculture
Secretary

Mr. V.C. (Lud) Prudek
Producer
Bow Island

Mr. Mel Richards
Producer
Olds

Mr. D.W. Schmidt
Former Minister of Agriculture
(Past Chairman)

Mr. E.J. Shimbashi
Chairman
Alberta Irrigation Council

Mr. W.H. Van de Walle
Producer
Legal

Mr. C.S. (Johnny) Vos
Producer
Keg River

Dr. D.E. Waldern
Research Scientist
Agriculture Canada – Lacombe

POOR

QUALITY

ORIGINAL